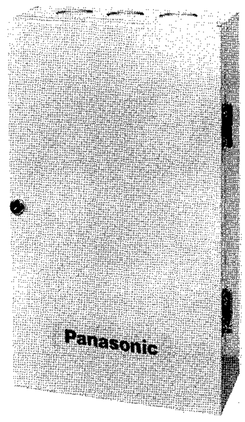
ORDER NO. AVS9409913C8

Service Manual

Combination Camera

WV-CS500

Combination Camera



Power Supply Unit

SPECIFICATIONS

Combination Camera

Power Source :	24V DC, 0.65A (Max. 1.9A)
Ambient Operating Temperature :	–10°C - +50°C (14°F - 122°F)
Dimensions	254(H) x 254(W) x 242(D) mm [10"(H) x 10"(W) x 9-1/2"(D)]
Weight :	5 kg (11 lbs.)

Camera

Pick-up Device :	1/2" CCD with 681(H) x 582(V) pixels
Synchronization :	Internal / MPX
Horizontal Scanning Frequency :	15.625 kHz
Vertical Scanning Frequency :	50.00 Hz
Video Output :	1.0 Vp-p PAL composite / 75 ohms
Horizontal Resolution :	More than 430 lines at center
Vertical Resolution :	More than 400 lines at center
Signal-to-noise :	46 dB (AGC OFF)
Minimum Illumination :	3 Lux
Zoom Speed :	Approx. 5.4 sec. (TELE / WIDE)
Focus Speed :	Approx. 6.7 sec. (FAR / NEAR)
Iris	Auto (Open / Close is possible)
Maximum Aperture Ratio :	1 : 1.4
Focal Length :	8 - 80 mm
Electronic Shutter :	1/50(OFF), 1/100, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000
Back Light Compensation :	Normal / Automatic / Preset mode
Zoom Ratio :	10 times
Focus Ratio :	F1.4 - 22

Pan / Tilt

Panning Ratio :	Maximum ±170°
Panning Angle Setting :	Possible
Panning mode :	Manual / Automatic / Random / Manual Position / Sequential Position / Sweep Position

Panasonic

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⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

CAUTION:
TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER SERVICEABLE PARTS INSIDE.
REFER SERVICEING TO QUALIFIED SERVICE PERSONNEL.

This symbol warns the user that uninsuland voltage within the unit may have suificient magnitude to cause electric shock. Therefore, it is dangerous to make any kind of contact with any inside part of this unit.

This symbol alerts the user that impotant literature concerning the operation and maintenance of this has been included. Therefore, it should be read carefully in order to avoid any problems.

IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are important for safety. These parts are indicated by the "⚠" mark on the schematic diagram and the replacement parts list. It is essential that these critical parts should be repleced with manufacture's specilied parts to prevent shock, fire, or other hazards.
Do not modify the original design without permission of manufacture.

Panning Speed :	Manual : Approx. 3°/sec., 24°/sec two steps Automatic : Approx. 12°/sec. Manual position : Maximum approx. 60°/sec.
Tilting Ratio :	0 - 90°
Tilting Angle Setting :	Impossible
Tilting Mode :	Manual / Manual Position / Sequencial Position / Sweep Position
Tilting Speed :	Manual : Approx. 1.5°/sec, 12°/sec. two steps Manual Position: Maximum approx. 30°/sec.
Controls :	Pan / Tilt, Lens, Camera stand-by, 64 preset Position Pan / Tilt (with WJ-PC10), Sweep Position, Home Position
Noise level:	Approx. 45 dB or less

Power Supply Unit

Power Supply :	230 - 240V AC at 50 Hz
Power Consumption :	60W
Camera Power Supply Output :	24V DC at 1.6A
Ambient Operating Humidity :	95% or less
Ambient Operating Temperature :	–10° C - +50° C (14°F - 122°F)
Dimensions :	160(W) x 280(H) x 65(D) mm [6-5/16"(W) x 11"(H) x 2-9/16"(D)]
Weights :	3.5kg (7.7 lbs.)

Weights and dimensions shown are approximate.
Specifications are subject to change without notice.

ACCESSORIES

Camera Mounting Angle	1 pc.
Camera Fixing Screw	1 pc.
Fall Prevention Wire	1 pc.
Decoration Cover	1 pc.
8-pin Connector with cable	1 pc.
Cable Clamp	2 pcs.
Bushing	2 pcs.
Dome Mounting Kit	1 set

CONTENTS

Major Operating Controls and Their Functions 1

Circuit Description

IC Description 3

Modification Procedure for E.V.R. Adjustment Kit 39

About Your Computer 40

Adjustment Procedure 41

Location of Test Points and Adjusting Controls 62

Chip Components 63

Appearance of IC, Transistor and Diode 65

Wiring Diagram 66

Block Diagram

CPU Board 67

Control Board 68

Receiver Board 69

Sync/Encoder Board 70

Drive Board 71

Digital Board 72

Schematic Diagram

Power Supply Board 73

CPU Board 74

Pan Limit Board and Tilt Limit Board 76

Control Board 78

Receiver Board 80

Sync/Encoder Board 82

Digital Board 85

Drive Board 86

Power Board 88

Sensor Board 89

Power Switch Board 90

Conductor View

Power Supply Board 73

CPU Board 77

Control Board Board 79

Receiver Board 81

Sync/Encoder Board 83

Digital Board 84

Drive Board 87

Power Board 88

Sensor Board 89

Power Switch Board 90

Exploded View

Main Unit 91

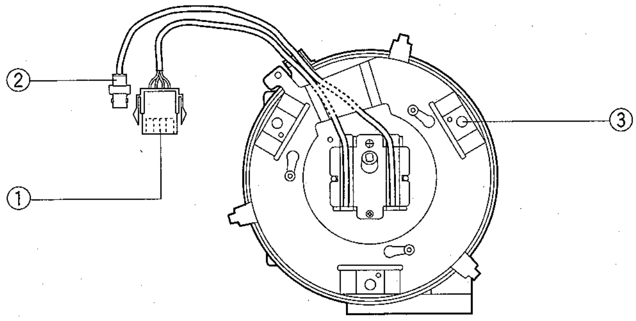
Power Supply Unit 92

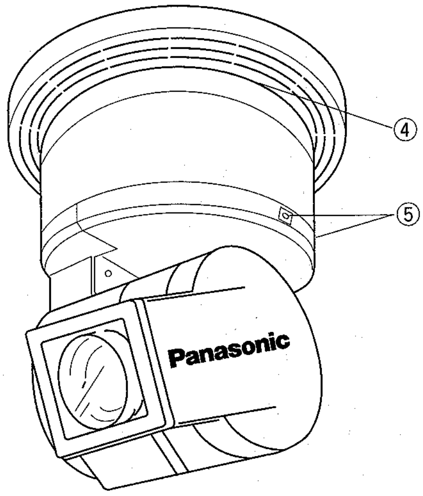
Camera Unit 93

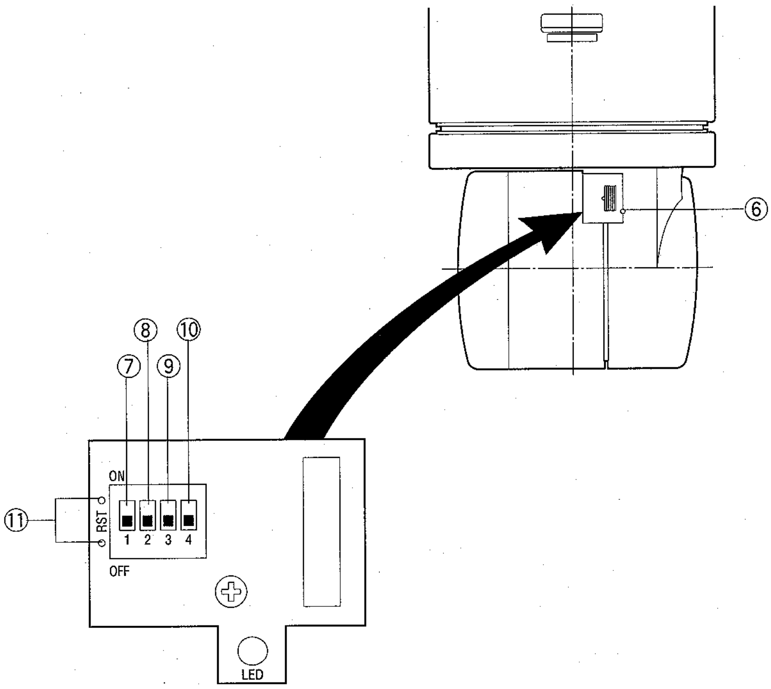
Replacement Parts List 94

MAJOR OPERATING CONTROLS AND THEIR FUNCTIONS

Combination Camera





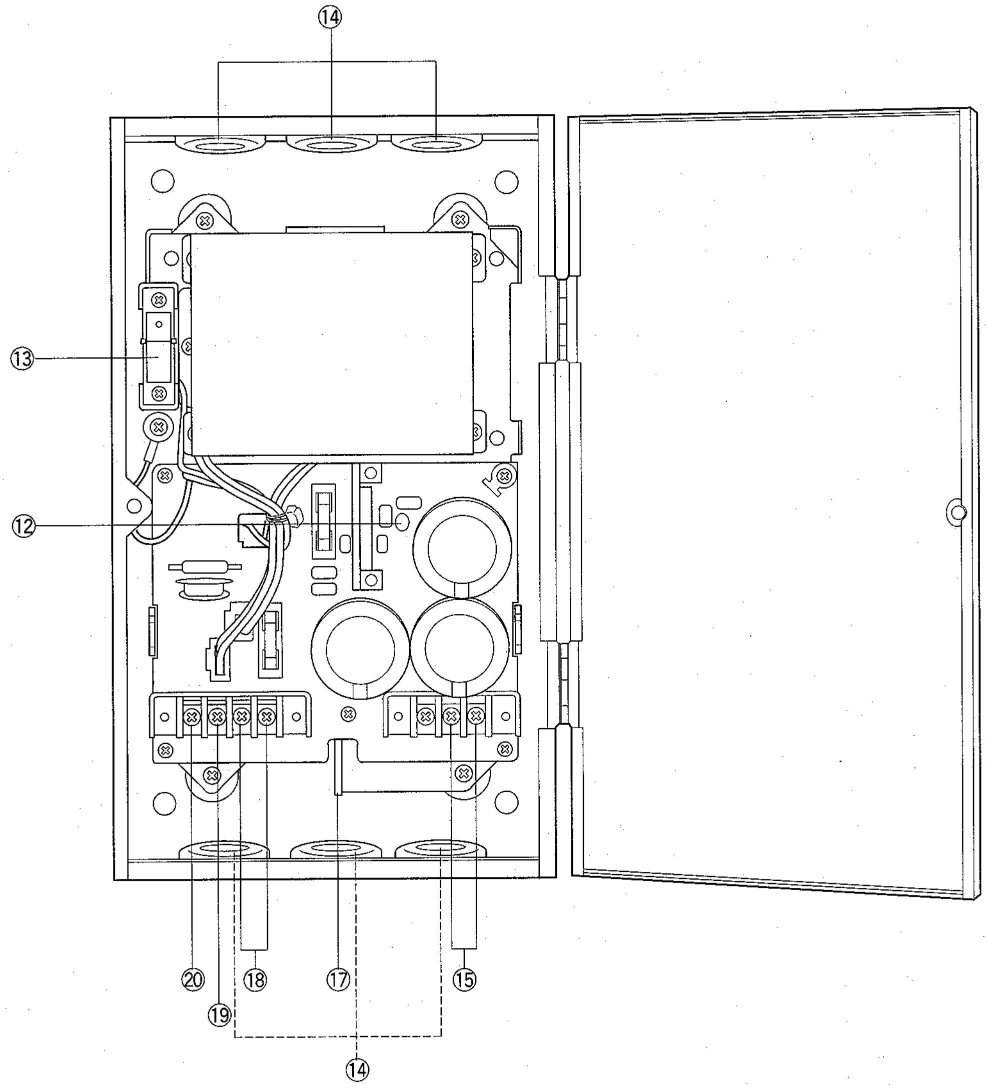


1. **Power Cable**
   To the Power Supply Unit (24V DC)
2. **Video Output Connector**
3. **Camera Fixing Angle**
4. **Decoration Cover**
5. **Pan Angle Limit Adjusting Screws**
   These screws are used to lock the Pan Angle Limit.
   Adjustable range is approx. 10° - 350° .
6. **Power Indicator**

Setting Condition		
Power Switch	Camera Unit	Indicator
OFF	–	Lights off
ON	Stand-by	Green
ON	ON	Red

7. **Random Panning Mode Selection Switch**
   (1, ON/OFF)
8. **Site Mode Selection Switch (2, ON/OFF)**
9. **Not used**
10. **Not used**
11. **Reset Terminal (RST)**
    To erase the preset memory, short these terminals.

Power Supply Unit



12. Power Indicator

13. Power On/Off Switch (POWER, ON/OFF)
By setting this switch to the ON position, the Power Indicator will light.

14. External Cable Holes
The external cables are connected via these holes.

15. Camera Terminal (+,-)
This terminal is used to connect with the Power Cable of the Combination Camera.

17. Cable Clamp

18. AC Power Terminal
230 - 240V AC at 50Hz, 60W

19. Un-used Terminal

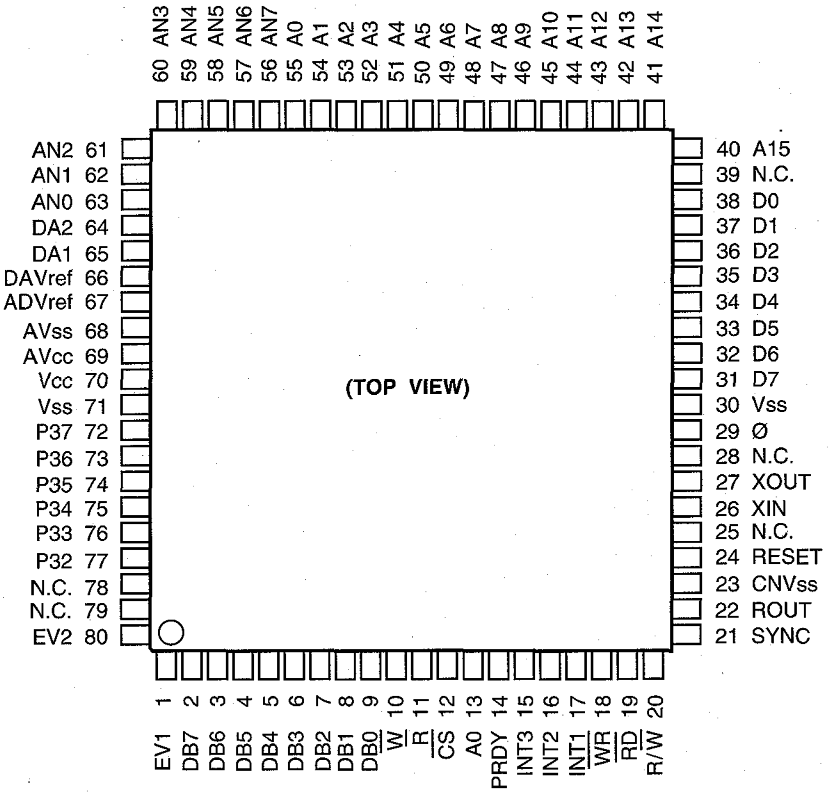
20. AC Frame Ground (FG I)

CIRCUIT DESCRIPTION

IC Description

1. CPU Board

1.1. IC101 on the CPU Board is using the Microprocessor IC YWM37451SGP.
Description of this IC is as follows:

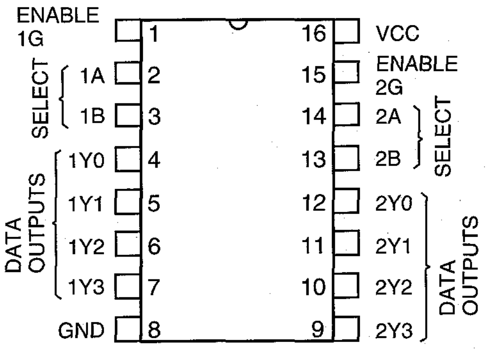

60 AN3
59 AN4
58 AN5
57 AN6
56 AN7
55 A0
54 A1
53 A2
52 A3
51 A4
50 A5
49 A6
48 A7
47 A8
46 A9
45 A10
44 A11
43 A12
42 A13
41 A14
AN2 61
AN1 62
AN0 63
DA2 64
DA1 65
DAVref 66
ADVref 67
AVss 68
AVcc 69
Vcc 70
Vss 71
P37 72
P36 73
P35 74
P34 75
P33 76
P32 77
N.C. 78
N.C. 79
EV2 80
(TOP VIEW)
40 A15
39 N.C.
38 D0
37 D1
36 D2
35 D3
34 D4
33 D5
32 D6
31 D7
30 Vss
29 Ø
28 N.C.
27 XOUT
26 XIN
25 N.C.
24 RESET
23 CNVss
22 ROUT
21 SYNC
1 EV1
2 DB7
3 DB6
4 DB5
5 DB4
6 DB3
7 DB2
8 DB1
9 DB0
10 W
11 R
12 CS
13 A0
14 PRDY
15 INT3
16 INT2
17 INT1
18 WR
19 RD
20 R/W

Pin	Name	I/O	Description
1	EV1	I	EV1 signal input terminal.
2	DB7	I/O	Data input/output terminals. (8-Bit)
3	DB6	I/O	
4	DB5	I/O	
5	DB4	I/O	
6	DB3	I/O	
7	DB2	I/O	
8	DB1	I/O	
9	DB0	I/O	
10	$\overline{W}$	I	Write signal input terminal.
11	$\overline{R}$	I	Read signal input terminal.
12	$\overline{CS}$	I	CS signal input terminal.
13	A0	I	A0 signal input terminal.
14	$\overline{PRDY}$	O	PRDY signal output terminal.
15	INT3	I	Interrupt signal input terminals.
16	INT2	I	
17	INT1	I	
18	$\overline{WR}$	O	Write Enable signal output terminal.
19	$\overline{RD}$	O	Read Enable signal output terminal.
20	R/$\overline{W}$	O	Read/Write selection signal output terminal.
21	SYNC	I	SYNC signal input terminal.
22	ROUT	O	R signal output terminal.
23	CNVss	–	Power supply terminal.
24	$\overline{RESET}$	I	Reset signal input terminal.
25	N.C.	–	Non connection.
26	XIN	I	Crystal Osc. input terminal.

Pin	Name	I/O	Description
27	XOUT	O	Crystal Osc. output terminal.
28	N.C.	–	Non connection.
29	Ø	O	Ø signal output terminal.
30	VSS	–	Ground terminal.
31	D7	I/O	Data input/output terminals. (8-Bit)
32	D6	I/O	
33	D5	I/O	
34	D4	I/O	
35	D3	I/O	
36	D2	I/O	
37	D1	I/O	
38	D0	I/O	
39	N.C.	–	Non connection.
40	A15	O	Address signal output terminals. (16-Bit)
41	A14	O	
42	A13	O	
43	A12	O	
44	A11	O	
45	A10	O	
46	A9	O	
47	A8	O	
48	A7	O	
49	A6	O	
50	A5	O	
51	A4	O	
52	A3	O	
53	A2	O	
54	A1	O	
55	A0	O	
56	AN7	I	AN signal input terminals. (8-Bit)
57	AN6	I	
58	AN5	I	
59	AN4	I	
60	AN3	I	
61	AN2	I	
62	AN1	I	
63	AN0	I	
64	DA2	O	DA2 signal output terminal.
65	DA1	O	DA1 signal output terminal.
66	DAVref	I	Reference voltage input terminal for D/A Converter.
67	ADVref	I	Reference voltage input terminal for A/D Converter.

Pin	Name	I/O	Description
68	AVss	–	Ground terminal terminal.
69	AVcc	–	Power supply terminal.
70	Vcc	–	Power supply terminal.
71	Vss	–	Ground terminal terminal.
72	P37	I	PA.RES signal input terminal.
73	P36	I	P36 signal input terminal.
74	P35	I	P35 signal input terminal.
75	P34	I	P34 signal input terminal.
76	P33	O	P33 signal output terminal.
77	P32	I	P32 signal input terminal.
78	N.C.	–	Non connection.
79	N.C.	–	Non connection.
80	EV2	I	EV2 signal input terminal.

1.2. IC108 on the CPU Board is using the Dual 2 to 4 Demultiplexers IC MC74HC139AF.
Description of this IC is as follows:



(TOP VIEW)

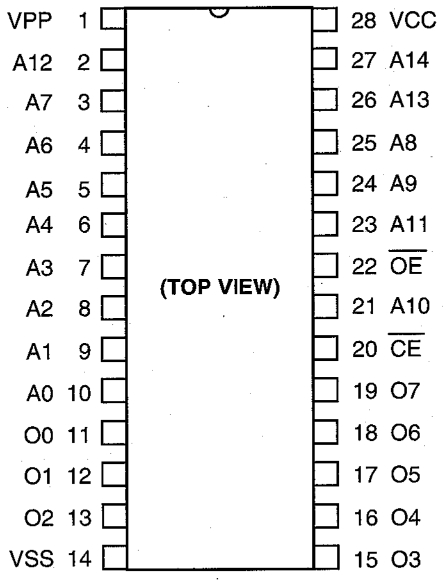
Truth Table

INPUTS			OUTPUTS			
ENABLE	SELECT					
G	A	B	Y0	Y1	Y2	Y3
H	*	*	H	H	H	H
L	L	L	L	H	H	H
L	L	H	H	L	H	H
L	H	L	H	H	L	H
L	H	H	H	H	H	L

* : Don't care.

1.3. IC102 on the CPU Board is using the ROM IC YWHN27CS50V6.

Description of this IC is as follows:

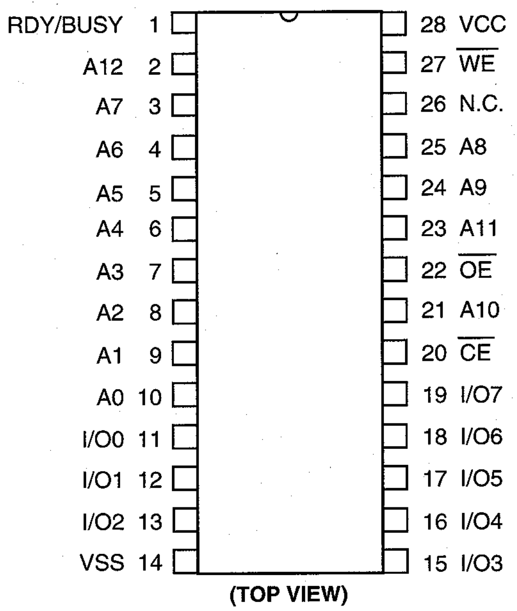


VPP 1
A12 2
A7 3
A6 4
A5 5
A4 6
A3 7
A2 8
A1 9
A0 10
O0 11
O1 12
O2 13
VSS 14
(TOP VIEW)
28 VCC
27 A14
26 A13
25 A8
24 A9
23 A11
22 $\overline{OE}$
21 A10
20 $\overline{CE}$
19 O7
18 O6
17 O5
16 O4
15 O3

Pin	Name	I/O	Description
1	VPP	–	Power supply terminal.
2	A12	I	Address input terminals.
3	A7	I	
4	A6	I	
5	A5	I	
6	A4	I	
7	A3	I	
8	A2	I	
9	A1	I	
10	A0	I	
11	I/O0	I/O	DATA Bus terminals. (8-Bit)
12	I/O1	I/O	
13	I/O2	I/O	
14	VSS	–	Ground terminal.
15	I/O3	I/O	DATA Bus terminals. (8-Bit)
16	I/O4	I/O	
17	I/O5	I/O	
18	I/O6	I/O	
19	I/O7	I/O	
20	$\overline{CE}$	I	Chip Enable signal input terminal.
21	A10	I	Address signal input terminal.
22	$\overline{OE}$	I	Output Enable signal input terminal.
23	A11	I	Address signal input terminals.
24	A9	I	
25	A8	I	
26	A13	I	
27	A14	I	
28	Vcc	–	Power supply terminal.

1.4. IC103 on the CPU Board is using the 64k-bit EEPROM IC YWHN58C65HP.

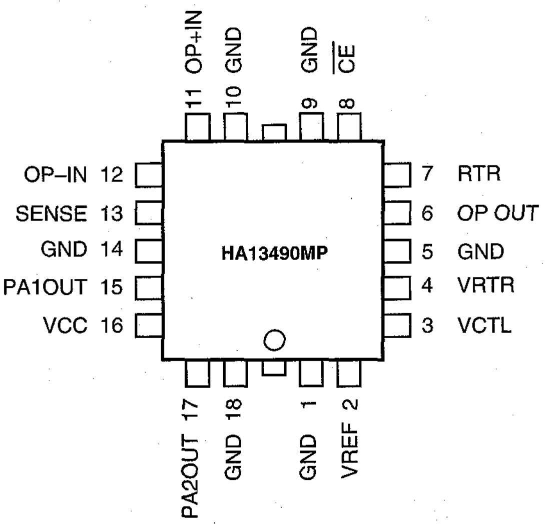
Description of this IC is as follows:



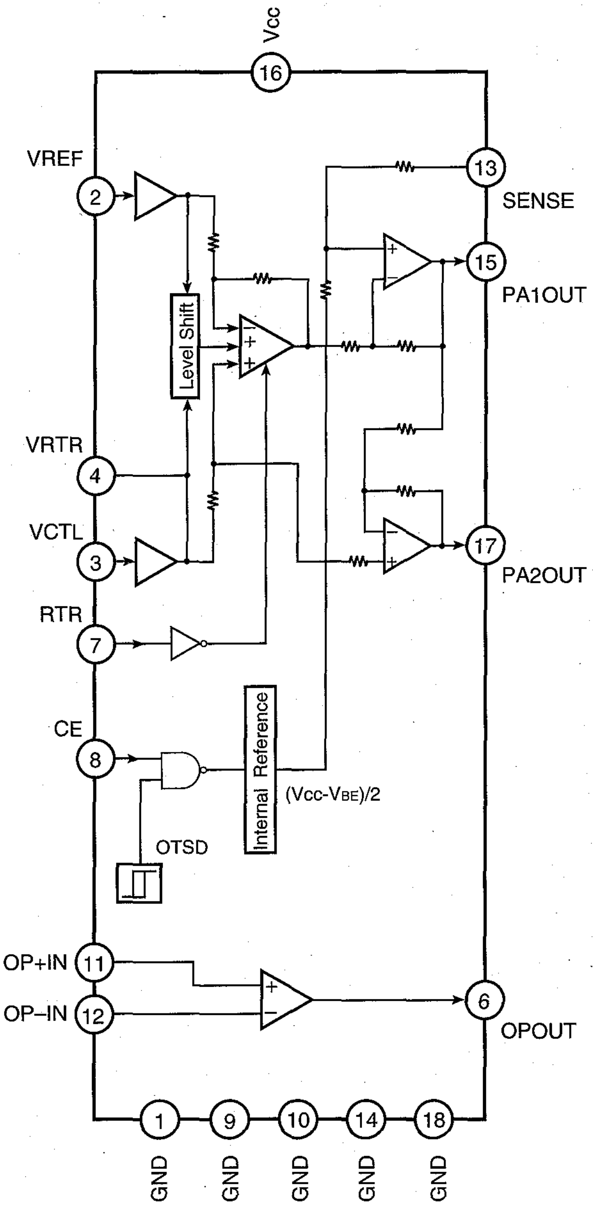
RDY/BUSY 1
A12 2
A7 3
A6 4
A5 5
A4 6
A3 7
A2 8
A1 9
A0 10
I/O0 11
I/O1 12
I/O2 13
VSS 14
28 VCC
27 $\overline{WE}$
26 N.C.
25 A8
24 A9
23 A11
22 $\overline{OE}$
21 A10
20 $\overline{CE}$
19 I/O7
18 I/O6
17 I/O5
16 I/O4
15 I/O3
(TOP VIEW)

Pin	Name	I/O	Description
1	RDY/ BUSY	O	RDY/BUSY signal output terminal.
2	A12	I	Address input terminals.
3	A7	I	
4	A6	I	
5	A5	I	
6	A4	I	
7	A3	I	
8	A2	I	
9	A1	I	
10	A0	I	
11	I/O0	I/O	DATA Bus terminals. (8-Bit)
12	I/O1	I/O	
13	I/O2	I/O	
14	VSS	–	Ground terminal.
15	I/O3	I/O	DATA Bus terminals. (8-Bit)
16	I/O4	I/O	
17	I/O5	I/O	
18	I/O6	I/O	
19	I/O7	I/O	
20	$\overline{CE}$	I	Chip Enable signal input terminal.
21	A10	I	Address signal input terminal.
22	$\overline{OE}$	I	Output Enable signal input terminal.
23	A11	I	Address signal input terminals.
24	A9	I	
25	A8	I	
26	N.C.	–	Non connection.
27	$\overline{WE}$	I	Write Enable signal input terminal.
28	VCC	–	Power supply terminal.

1.5. IC207 and IC304 on the CPU Board are using the Motor Drive IC YWHA13490MP.
Description of this IC is as follows:

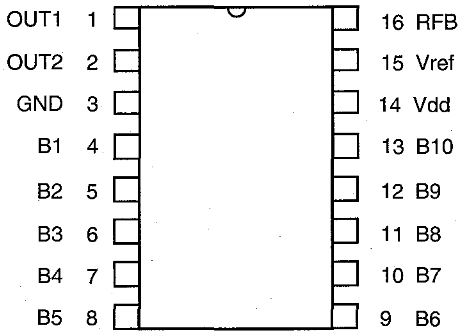

11 OP+IN
10 GND
9 GND
8 CE
OP–IN 12
SENSE 13
GND 14
PA1OUT 15
VCC 16
HA13490MP
7 RTR
6 OP OUT
5 GND
4 VRTR
3 VCTL
PA2OUT 17
GND 18
GND 1
VREF 2

(TOP VIEW)


Vcc
16
VREF
2
13
SENSE
15
PA1OUT
Level Shift
VRTR
4
VCTL
3
17
PA2OUT
RTR
7
CE
8
Internal Reference
(Vcc-VBE)/2
OTSD
OP+IN
11
OP–IN
12
6
OPOUT
1
9
10
14
18
GND
GND
GND
GND
GND

Pin	Name	I/O	Description
1	GND	–	Ground terminal.
2	VREF	I	Reference voltage input terminal.
3	VCTL	I	Control signal input terminal.
4	VRTR	I	Retuct voltage input terminal.
5	GND	–	Ground terminal.
6	OP OUT	O	Operational Amplifier output terminal.
7	RTR	I	Retuct signal input terminal.
8	$\overline{\text{CE}}$	I	$\overline{\text{CE}}$ signal input terminal.
9	GND	–	Ground terminal.
10	GND	–	Ground terminal.
11	OP+IN	I	OP+ signal input terminal.
12	OP–IN	I	OP– signal input terminal.
13	SENSE	I	SENSE signal input terminal.
14	GND	–	Ground terminal.
15	PA1OUT	O	PA1 signal output terminal.
16	VCC	–	Power supply terminal.
17	PA2OUT	O	PA2 signal output terminal.
18	GND	–	Ground terminal.

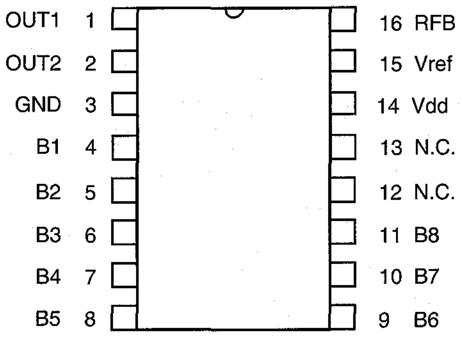
1.6. IC204 on the CPU Board is using the 10-bit D/A Converter IC YWNJU8101M.
Description of this IC is as follows:


OUT1 1
OUT2 2
GND 3
B1 4
B2 5
B3 6
B4 7
B5 8
16 RFB
15 Vref
14 Vdd
13 B10
12 B9
11 B8
10 B7
9 B6

(TOP VIEW)

Pin	Name	I/O	Description
1	OUT1	O	Output terminal 1.
2	OUT2	O	Output terminal 2.
3	GND	–	Ground terminal.
4	B1	I	(MSB)
5	B2	I	Parallel Data input terminals. (10-Bit)
6	B3	I	
7	B4	I	
8	B5	I	
9	B6	I	
10	B7	I	
11	B8	I	
12	B9	I	
13	B10	I	(LSB)
14	Vdd	–	Power supply terminal.
15	Vref	–	Reference voltage terminal.
16	RFB	–	Feedback terminal.

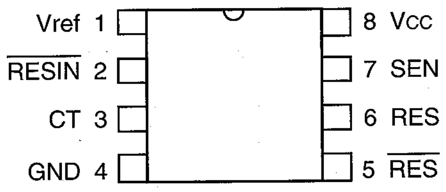
1.7. IC302 on the CPU Board is using the 8-bit D/A Converter IC YWNJU8001M.
Description of this IC is as follows:


OUT1 1
OUT2 2
GND 3
B1 4
B2 5
B3 6
B4 7
B5 8
16 RFB
15 Vref
14 Vdd
13 N.C.
12 N.C.
11 B8
10 B7
9 B6

(TOP VIEW)

Pin	Name	I/O	Description
1	OUT1	O	Output terminal 1.
2	OUT2	O	Output terminal 2.
3	GND	–	Ground terminal.
4	B1	I	(MSB)
5	B2	I	Parallel Data input terminals. (8-Bit)
6	B3	I	
7	B4	I	
8	B5	I	
9	B6	I	
10	B7	I	
11	B8	I	(LSB)
12	N.C.	–	Non connection.
13	N.C.	–	Non connection.
14	Vdd	–	Power supply terminal.
15	Vref	–	Reference voltage terminal.
16	RFB	–	Feedback terminal.

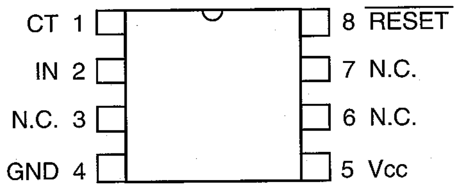
1.8. IC104 on the CPU Board is using the Voltage Detector IC YWTL7705CPBF.
Description of this IC is as follows:


Vref 1
$\overline{\text{RESIN}}$ 2
CT 3
GND 4
8 Vcc
7 SEN
6 RES
5 $\overline{\text{RES}}$

(TOP VIEW)

Pin	Name	I/O	Description
1	Vref	–	Reference voltage terminal.
2	$\overline{\text{RESIN}}$	I	Reset signal input terminal.
3	CT	I	Capacitor connecting terminal.
4	GND	–	Ground terminal.
5	$\overline{\text{RES}}$	O	Reset signal output terminal.
6	RES	O	Reset signal output terminal.
7	SEN	I	Sense signal input terminal.
8	Vcc	–	Power supply terminal.

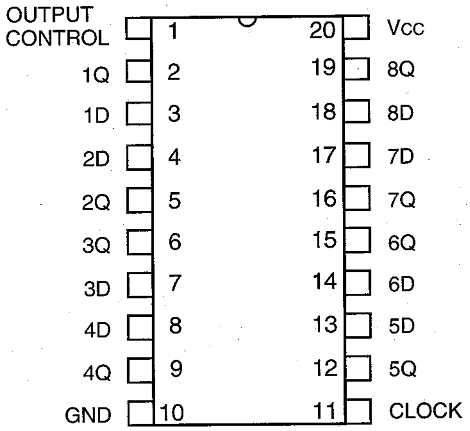
1.9. IC105 on the CPU Board is using the Voltage Detector IC YWTL7700CPBF.
Description of this IC is as follows:


CT 1
IN 2
N.C. 3
GND 4
8 $\overline{\text{RESET}}$
7 N.C.
6 N.C.
5 Vcc

(TOP VIEW)

Pin	Name	I/O	Description
1	CT	I	Capacitor connecting terminal.
2	IN	I	Voltage Detect input terminal.
3	N.C.	–	Non connection.
4	GND	–	Ground terminal.
5	Vcc	–	Power supply terminal.
6	N.C.	–	Non connection.
7	N.C.	–	Non connection.
8	$\overline{\text{RESET}}$	O	$\overline{\text{Reset}}$ signal output terminal.

1.10. IC201 to IC203 and IC301 on the CPU Board and IC506, IC606 and IC602 on the Control Board are using the Octal D-FFs IC MC74HC374AF.
Description of this IC is as follows:


OUTPUT CONTROL 1
1Q 2
1D 3
2D 4
2Q 5
3Q 6
3D 7
4D 8
4Q 9
GND 10
20 Vcc
19 8Q
18 8D
17 7D
16 7Q
15 6Q
14 6D
13 5D
12 5Q
11 CLOCK

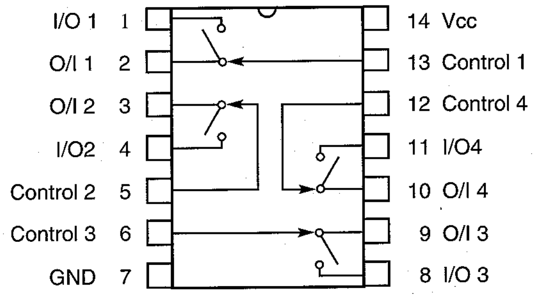
(TOP VIEW)

Truth Table

INPUTS			OUTPUTS	
Output Control	D	CK	Q	$\overline{Q}$
∗	L	↑	L	H
∗	H	↑	H	L
H	∗	∗	Z	

∗ : Don't care.
Z : High Impedance

1.11. IC404 on the CPU Board is using the Quad Analog Switches/Multiplexers/Demultiplexers IC MC74HC 4066F.
Description of this IC is as follows:

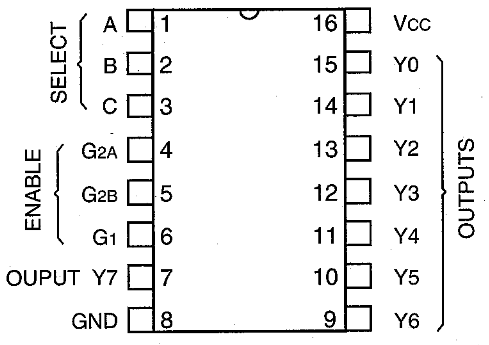

I/O 1 1
O/I 1 2
O/I 2 3
I/O2 4
Control 2 5
Control 3 6
GND 7
14 Vcc
13 Control 1
12 Control 4
11 I/O4
10 O/I 4
9 O/I 3
8 I/O 3

(TOP VIEW)

Truth Table

Input	Switch
Control	I/O – O/I
L	OFF
H	ON

1.12. IC107 and IC110 on the CPU Board are using the 3 to 8 Demultiplexer IC YW74F138SJ.
Description of this IC is as follows:


SELECT
A
B
C
ENABLE
G2A
G2B
G1
OUPUT Y7
GND
1
2
3
4
5
6
7
8
16
15
14
13
12
11
10
9
Vcc
Y0
Y1
Y2
Y3
Y4
Y5
Y6
OUTPUTS

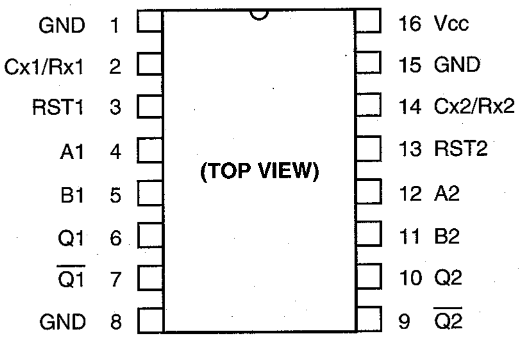
(TOP VIEW)

Truth Table

INPUTS					OUTPUTS							
ENABLE		SELECT										
G1	G2 *1	C	B	A	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7
*	H	*	*	*	H	H	H	H	H	H	H	H
L	*	*	*	*	H	H	H	H	H	H	H	H
H	L	L	L	L	L	H	H	H	H	H	H	H
H	L	L	L	H	H	L	H	H	H	H	H	H
H	L	L	H	L	H	H	L	H	H	H	H	H
H	L	L	H	H	H	H	H	L	H	H	H	H
H	L	H	L	L	H	H	H	H	L	H	H	H
H	L	H	L	H	H	H	H	H	H	L	H	H
H	L	H	H	L	H	H	H	H	H	H	L	H
H	L	H	H	H	H	H	H	H	H	H	H	L

* : Don't care.
*1 : $G_2 = G_{2A} + G_{2B}$

1.13. IC113 on the CPU Board is using the Dual Precision Retriggerable Monostable Multivibrator IC MC74HC 4538AF.
Description of this IC is as follows:

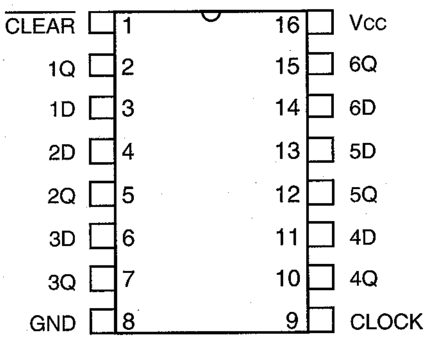

GND 1
Cx1/Rx1 2
RST1 3
A1 4
B1 5
Q1 6
$\overline{Q1}$ 7
GND 8
(TOP VIEW)
16 Vcc
15 GND
14 Cx2/Rx2
13 RST2
12 A2
11 B2
10 Q2
9 $\overline{Q2}$

Truth Table

INPUTS			OUTPUTS		NOTE
A	B	RESET	Q	$\overline{Q}$	
↑	H	H	⊓	⊔	Output Pulse
↑	L	H	L	H	Inhibit
H	↓	H	L	H	Inhibit
L	↓	H	⊓	⊔	Output Pulse
*	*	L	L	H	Inhibit

* : Don't care.

1.14. IC114 on the CPU Board is using the Hex D-FFs IC MC74HC174AF.
Description of this IC is as follows:


$\overline{CLEAR}$
1Q
1D
2D
2Q
3D
3Q
GND
1
2
3
4
5
6
7
8
16
15
14
13
12
11
10
9
Vcc
6Q
6D
5D
5Q
4D
4Q
CLOCK

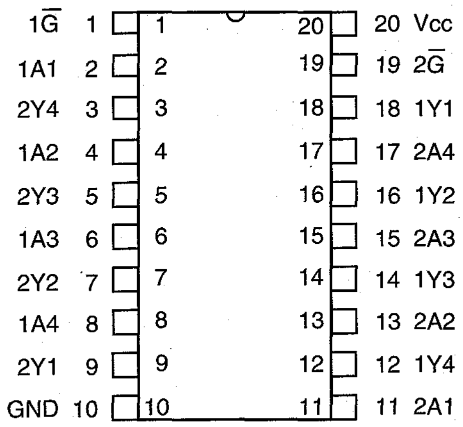
(TOP VIEW)

Truth Table

INPUTS			OUTPUTS		Function
$\overline{CLR}$	D	CK	Q	$\overline{Q}$	
L	*	*	L	H	Clear
H	L	↑	L	H	——
H	H	↑	H	L	——
H	*	↓	Qn	$\overline{Qn}$	No Change

* : Don't care.

1.15. IC119 on the CPU Board is using the Octal 3-State Bus Inverters IC MC74HC240AF.
Description of this IC is as follows:


1$\overline{G}$ 1
1A1 2
2Y4 3
1A2 4
2Y3 5
1A3 6
2Y2 7
1A4 8
2Y1 9
GND 10
20 Vcc
19 2$\overline{G}$
18 1Y1
17 2A4
16 1Y2
15 2A3
14 1Y3
13 2A2
12 1Y4
11 2A1

(TOP VIEW)

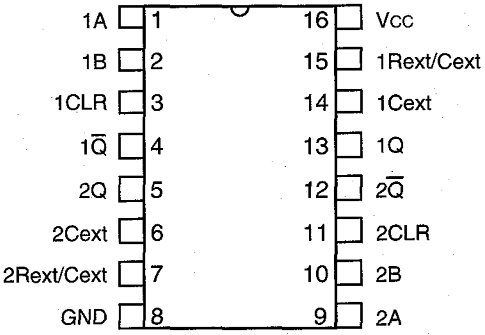
Truth Table

INPUTS		OUTPUT
$\overline{G}$	A	Y
H	*	Z
L	L	H
L	H	L

* : Don't care.
Z : High Impedance

2. Control Board

2.1. IC702 on the Control Board is using the Dual Monostable Multivibrators IC YWHD74HC123F.
Description of this IC is as follows:


1A 1
1B 2
1CLR 3
1$\overline{Q}$ 4
2Q 5
2Cext 6
2Rext/Cext 7
GND 8
16 Vcc
15 1Rext/Cext
14 1Cext
13 1Q
12 2$\overline{Q}$
11 2CLR
10 2B
9 2A

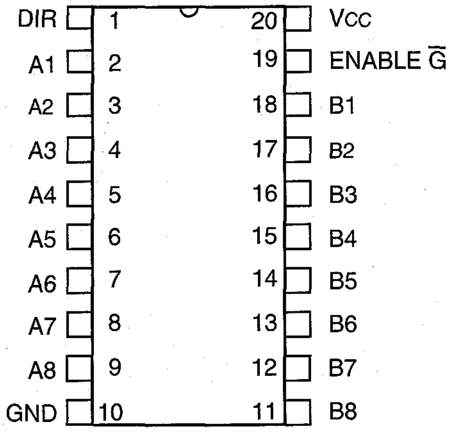
(TOP VIEW)

Truth Table

INPUTS			OUTPUTS	
A	B	CLEAR	Q	$\overline{Q}$
*	*	L	L	H
H	*	*	L	H
*	L	*	L	H
L	↑	H	⊓	⊔
↓	H	H	⊓	⊔
L	H	↑	⊓	⊔

* : Don't care.

2.2. IC704 on the Control Board is using the Octal 3-state Bus Transceivers IC MC74HC245AF.
Description of this IC is as follows:


DIR 1
A1 2
A2 3
A3 4
A4 5
A5 6
A6 7
A7 8
A8 9
GND 10
20 Vcc
19 ENABLE $\overline{G}$
18 B1
17 B2
16 B3
15 B4
14 B5
13 B6
12 B7
11 B8

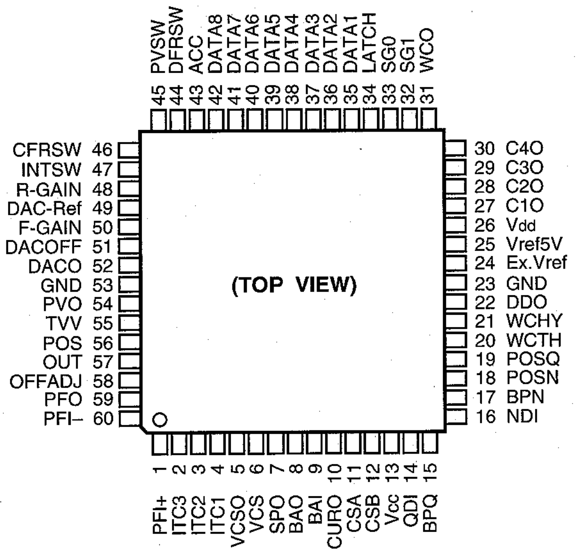
(TOP VIEW)

Truth Table

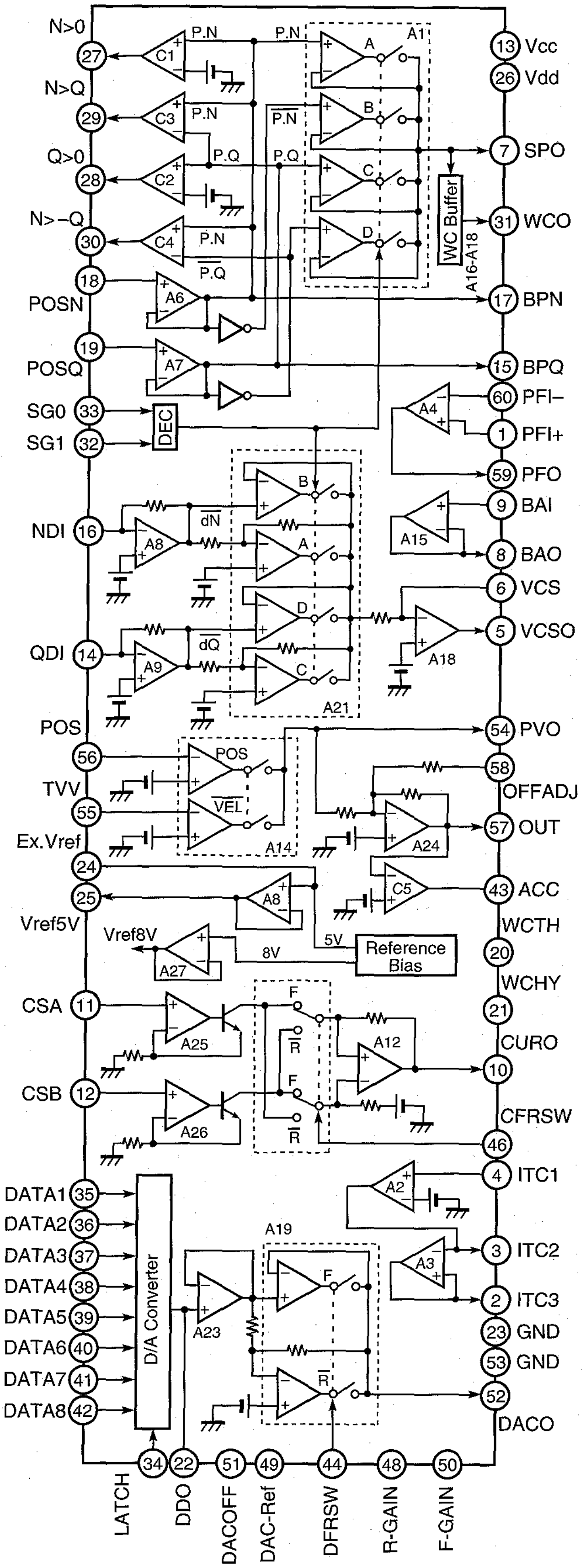
INPUTS		*Function*
DIR	$\overline{G}$	
H	L	A ⟶ B
L	L	B ⟶ A
*	H	A OFF B

* : Don't care.

2.3. IC501 and IC601 on the Control Board are using the Motor Servo IC YWM52838FP. Description of this IC is as follows:


(TOP VIEW)
45 PVSW
44 DFRSW
43 ACC
42 DATA8
41 DATA7
40 DATA6
39 DATA5
38 DATA4
37 DATA3
36 DATA2
35 DATA1
34 LATCH
33 SG0
32 SG1
31 WCO
30 C4O
29 C3O
28 C2O
27 C1O
26 Vdd
25 Vref5V
24 Ex.Vref
23 GND
22 DDO
21 WCHY
20 WCTH
19 POSQ
18 POSN
17 BPN
16 NDI
CFRSW 46
INTSW 47
R-GAIN 48
DAC-Ref 49
F-GAIN 50
DACOFF 51
DACO 52
GND 53
PVO 54
TVV 55
POS 56
OUT 57
OFFADJ 58
PFO 59
PFI– 60
1 PFI+
2 ITC3
3 ITC2
4 ITC1
5 VCSO
6 VCS
7 SPO
8 BAO
9 BAI
10 CURO
11 CSA
12 CSB
13 Vcc
14 QDI
15 BPQ

Pin	Name	I/O	Description
1	PFI+	I	A4 Amp. non-inverting input terminal.
2	ITC3	O	A3 Amp. output terminal.
3	ITC2	O	A2 Amp. output terminal.
4	ITC1	I	A2 Amp. inverting input terminal.
5	VCSO	O	VCS signal output terminal.
6	VCS	I	VCS signal input terminal.
7	SPO	O	Sel. Position signal output terminal.
8	BAO	O	BA signal output terminal.
9	BAI	I	BA signal input terminal.
10	CURO	O	Current Sense signal output terminal.
11	CSA	I	Current Sense A input terminal.
12	CSB	I	Current Sense B input terminal.
13	Vcc	–	Power supply terminal.
14	QDI	I	Q Differential signal input terminal.
15	BPQ	O	POSQ signal output terminal.
16	NDI	I	N Differential signal input terminal.
17	BPN	O	POSN signal output terminal.
18	POSN	I	Position N signal input terminal.
19	POSQ	I	Position Q signal input terminal.
20	WCTH	I	WC Threshold signal input terminal.
21	WCHY	I	WC Hysteresis width signal input terminal.
22	DDO	O	DD signal input terminal.
23	GND	–	Ground terminal.
24	Ex.Vref	–	External reference voltage supply terminal.
25	Vref5V	O	Reference voltage (5V) output terminal.
26	Vdd	–	Power supply terminal.
27	C1O	O	N>0 signal output terminal.
28	C2O	O	N>Q signal output terminal.
29	C3O	O	Q>0 signal output terminal.
30	C4O	O	N>−Q signal output terminal.
31	WCO	O	WC signal output terminal.
32	SG1	I	Gate selection 1 signal input terminal.
33	SG0	I	Gate selection 0 signal input terminal.
34	LATCH	I	Latch signal input terminal.
35	DATA1	I	(LSB)
36	DATA2	I	Parallel Data input terminals for D/A Converter circuit. (8-Bit)
37	DATA3	I	
38	DATA4	I	
39	DATA5	I	
40	DATA6	I	
41	DATA7	I	
42	DATA8	I	(MSB)
43	ACC	O	ACC signal output terminal.
44	DFRSW	I	DAC F/$\overline{R}$ switching signal input terminal.
45	PVSW	I	POS/$\overline{VEL}$ switching signal input terminal.
46	CFRSW	I	Current Sense F/$\overline{R}$ switching signal input terminal.
47	INTSW	I	Int. $\overline{ON}$/OFF switching signal input terminal.
48	R-GAIN	I	DAC R-Gain control terminal.
49	DAC-Ref	–	DAC reference voltage terminal.
50	F-GAIN	I	DAC F-Gain control terminal.
51	DACOFF	I	DAC Offset control terminal.
52	DACO	O	DAC output terminal.
53	GND	–	Ground terminal.
54	PVO	O	POS/VEL signal output terminal.
55	TVV	I	TVV signal input terminal.
56	POS	I	POS signal input terminal.
57	OUT	O	Servo signal output terminal.
58	OFFADJ	I	Offset voltage adjusting terminal.
59	PFO	O	A4 Amp. output terminal.
60	PFI–	I	A4 Amp. inverting input terminal.


N>0
27
C1
P.N
N>Q
29
C3
Q>0
28
C2
P.Q
N>−Q
30
C4
$\overline{P.Q}$
18
POSN
A6
19
POSQ
A7
SG0 33
SG1 32
DEC
A
B
C
D
A1
$\overline{P.N}$
WC Buffer
A16-A18
13 Vcc
26 Vdd
7 SPO
31 WCO
17 BPN
15 BPQ
60 PFI−
A4
1 PFI+
59 PFO
9 BAI
A15
8 BAO
6 VCS
5 VCSO
A18
NDI 16
A8
$\overline{dN}$
QDI 14
A9
$\overline{dQ}$
A21
POS
56
TVV
55
POS
VEL
A14
Ex.Vref
24
25
A8
Vref5V
Vref8V
A27
8V
5V
Reference Bias
54 PVO
58
OFFADJ
A24
57 OUT
C5
43 ACC
WCTH
20
WCHY
21
CURO
10
CFRSW
46
CSA 11
A25
CSB 12
A26
F
R
A12
4 ITC1
A2
3 ITC2
A3
2 ITC3
23 GND
53 GND
52
DACO
DATA1 35
DATA2 36
DATA3 37
DATA4 38
DATA5 39
DATA6 40
DATA7 41
DATA8 42
D/A Converter
A23
A19
34 LATCH
22 DDO
51 DACOFF
49 DAC-Ref
44 DFRSW
48 R-GAIN
50 F-GAIN

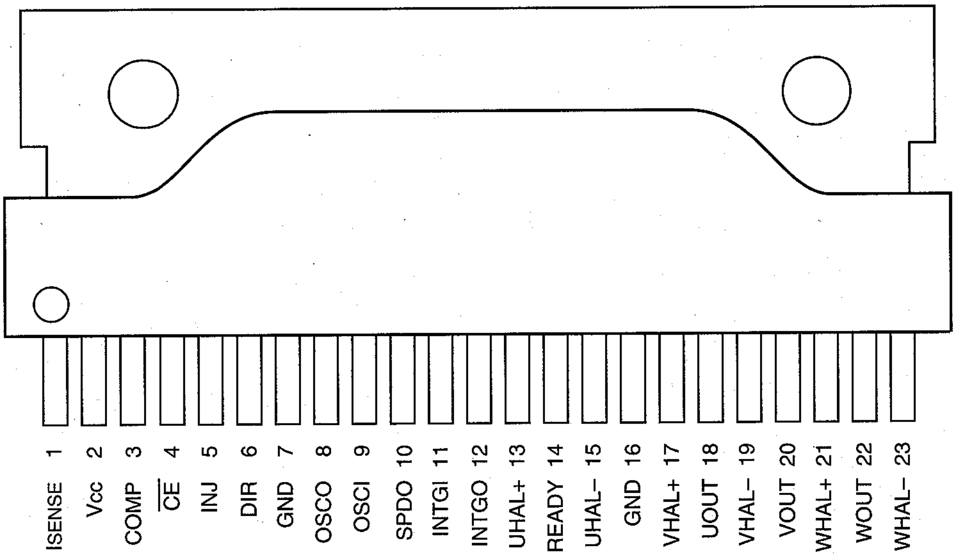
A1 SEL.

S GATE		SELECT	
SG0	SG1	SW	SIG
L	L	C	Q
H	L	B	$\overline{N}$
H	H	D	$\overline{Q}$
L	H	A	N

A21 SEL.

S GATE		SELECT	
SG0	SG1	SW	SIG
L	L	C	dQ
H	L	B	$\overline{dN}$
H	H	D	$\overline{dQ}$
L	H	A	dN

2.4. IC502 and IC602 on the Control Board are using the Motor Drive IC YWHA13441V.
Description of this IC is as follows:

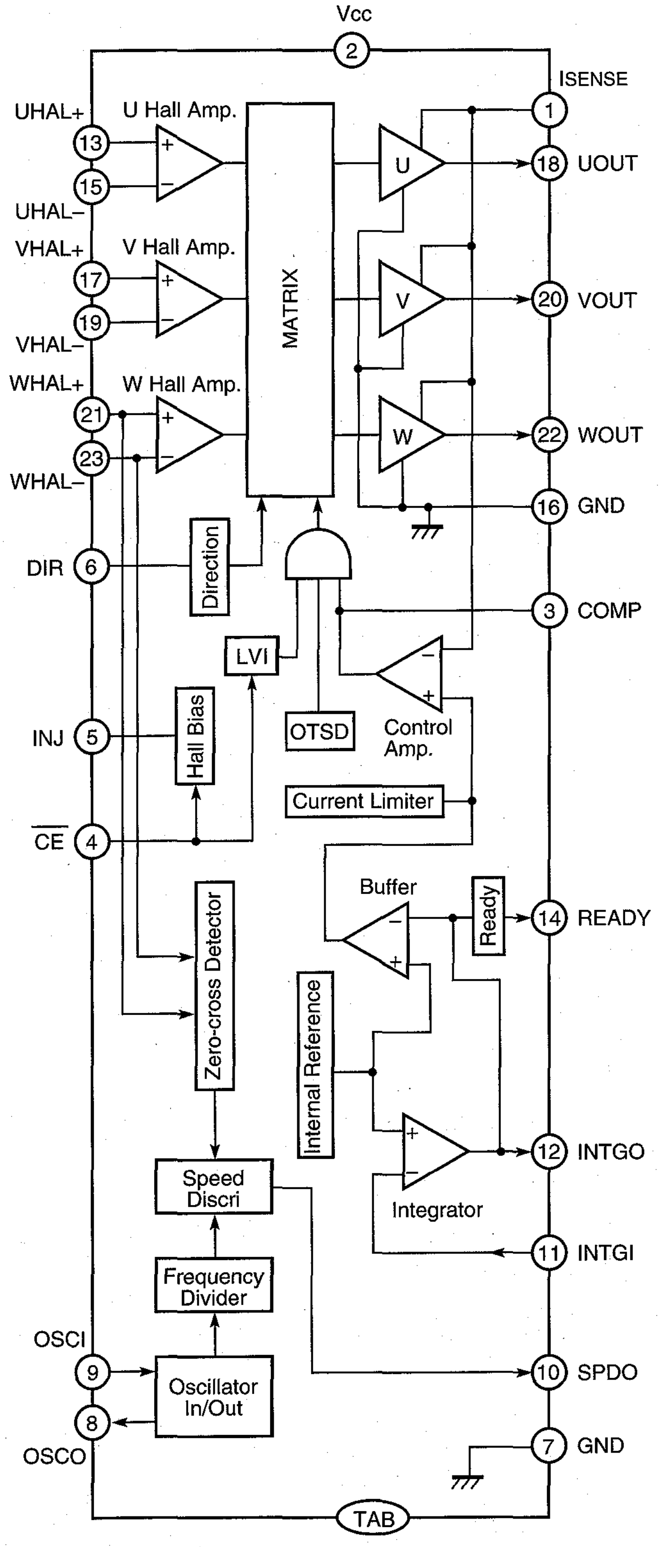

ISENSE 1
Vcc 2
COMP 3
$\overline{\text{CE}}$ 4
INJ 5
DIR 6
GND 7
OSCO 8
OSCI 9
SPDO 10
INTGI 11
INTGO 12
UHAL+ 13
READY 14
UHAL– 15
GND 16
VHAL+ 17
UOUT 18
VHAL– 19
VOUT 20
WHAL+ 21
WOUT 22
WHAL– 23

Pin	Name	I/O	Description
1	ISENSE	–	Current sense terminal.
2	Vcc	–	Power supply terminal.
3	COMP	–	Phase compensation terminal.
4	$\overline{\text{CE}}$	I	$\overline{\text{CE}}$ signal input terminal.
5	INJ	I	Injection signal input terminal.
6	DIR	I	Direction signal input terminal.
7	GND	–	Ground terminal.
8	OSCO	O	Crystal oscillator output terminal.
9	OSCI	I	Crystal oscillator input terminal.
10	SPDO	O	Speed Discri signal output terminal.
11	INTGI	I	Integrator input terminal.
12	INTGO	O	Integrator output terminal.
13	UHAL+	I	U Hall + signal input terminal.
14	READY	O	Ready signal output terminal.
15	UHAL–	I	U Hall – signal input terminal.
16	GND	–	Power ground terminal.
17	VHAL+	I	V Hall + signal input terminal.
18	UOUT	O	U Hall signal output terminal.
19	VHAL–	I	V Hall – signal input terminal.
20	VOUT	O	V Hall signal output terminal.
21	WHAL+	I	W Hall + signal input terminal.
22	WOUT	O	W Hall signal output terminal.
23	WHAL–	I	W Hall – signal input terminal.

Truth Table

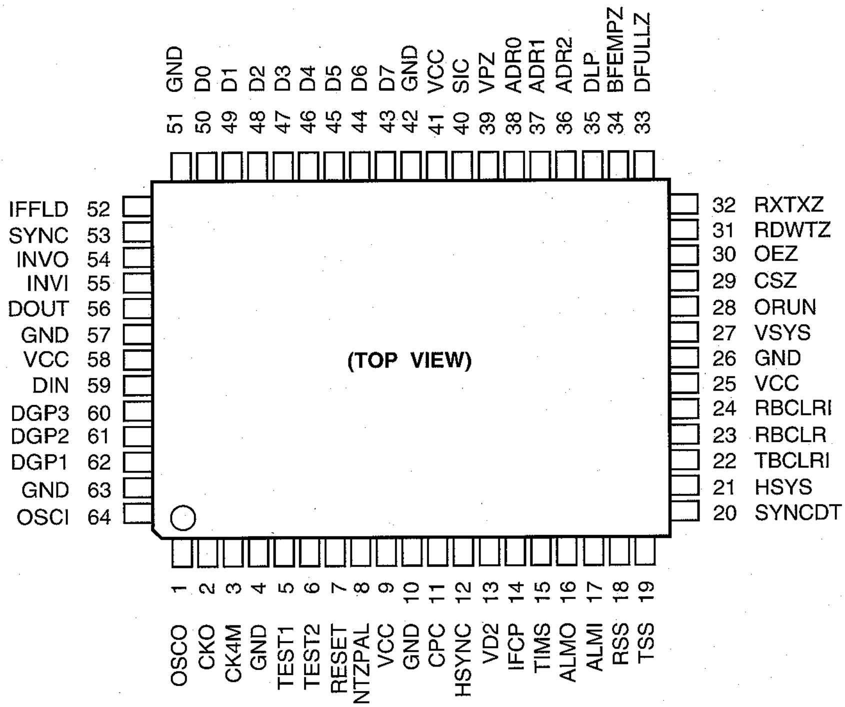
$\overline{\text{CE}}$	Direction	Hall Input			Output		
		U	V	W	U	V	W
L	L (H)	H	L	H	H (L)	L (H)	Open (Open)
		H	L	L	H (L)	Open (Open)	L (H)
		H	H	L	Open (Open)	H (L)	L (H)
		L	H	L	L (H)	H (L)	Open (Open)
		L	H	H	L (H)	Open (Open)	H (L)
		L	L	H	Open (Open)	L (H)	H (L)
H	*	*	*	*	Open		

Open : High Impedance
* : Don't care.


Vcc
2
ISENSE
1
UHAL+
U Hall Amp.
13
15
UHAL–
VHAL+
V Hall Amp.
17
19
VHAL–
WHAL+
W Hall Amp.
21
23
WHAL–
MATRIX
U
V
W
18 UOUT
20 VOUT
22 WOUT
16 GND
DIR 6
Direction
3 COMP
LVI
OTSD
Control Amp.
INJ 5
Hall Bias
Current Limiter
CE 4
Buffer
Ready
14 READY
Zero-cross Detector
Internal Reference
Integrator
12 INTGO
11 INTGI
Speed Discri
Frequency Divider
OSCI
9
Oscillator In/Out
8
OSCO
10 SPDO
7 GND
TAB

3. Receiver Board

3.1. IC4 on the Receiver Board is using the Data Communication GAL IC YWCF37808PG.
Description of this IC is as follows:


(TOP VIEW)
51 GND
50 D0
49 D1
48 D2
47 D3
46 D4
45 D5
44 D6
43 D7
42 GND
41 VCC
40 SIC
39 VPZ
38 ADR0
37 ADR1
36 ADR2
35 DLP
34 BFEMPZ
33 DFULLZ
IFFLD 52
SYNC 53
INVO 54
INVI 55
DOUT 56
GND 57
VCC 58
DIN 59
DGP3 60
DGP2 61
DGP1 62
GND 63
OSCI 64
32 RXTXZ
31 RDWTZ
30 OEZ
29 CSZ
28 ORUN
27 VSYS
26 GND
25 VCC
24 RBCLRI
23 RBCLR
22 TBCLRI
21 HSYS
20 SYNCDT
1 OSCO
2 CKO
3 CK4M
4 GND
5 TEST1
6 TEST2
7 RESET
8 NTZPAL
9 VCC
10 GND
11 CPC
12 HSYNC
13 VD2
14 IFCP
15 TIMS
16 ALMO
17 ALMI
18 RSS
19 TSS

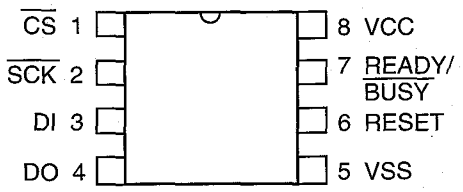
Pin	Name	I/O	Description
1	OSCO	O	Oscillator signal output terminal.
2	CKO	O	Clock signal output terminal.
3	CK4M	I	CK4M signal input terminal.
4	GND	–	Ground terminal.
5	TEST1	I	Test signal input terminals.
6	TEST2	I	
7	RESET	I	Reset signal input terminal.
8	NTZPAL	I	$\overline{\text{NTSC}}$/PAL select signal input terminal.
9	VCC	–	Power supply terminal.
10	GND	–	Ground terminal.
11	CPC	I	CPC signal input terminal.
12	HSYNC	O	HSYNC signal output terminal.
13	VD2	I	VD2 signal input terminal.
14	IFCP	O	IFCP signal output terminal.
15	TIMS	I	TIMS signal input terminal.
16	ALMO	O	ALMO signal output terminal.
17	ALMI	I	ALMI signal input terminal.
18	RSS	I	RSS signal input terminal.
19	TSS	I	TSS signal input terminal.
20	SYNCDET	O	SYNC detect signal output terminal.

Pin	Name	I/O	Description
21	HSYS	I	HSYS signal input terminal.
22	TBCLRI	I	TBCLRI signal input terminal.
23	RBCLR	O	RBCLR signal output terminal.
24	RBCLRI	I	RBCLRI signal input terminal.
25	VCC	–	Power supply terminal.
26	GND	–	Ground terminal.
27	VSYS	I	VSYS signal input terminal.
28	ORUN	O	ORUN signal output terminal.
29	CSZ	I	Chip Select signal input terminal.
30	OEZ	I	Output Enable signal input terminal.
31	RDWTZ	I	Read/$\overline{\text{Write}}$ signal input terminal.
32	RXTXZ	I	RX/$\overline{\text{TX}}$ signal input terminal.
33	DFULLZ	O	DFULL signal input terminal.
34	BFEMPZ	O	Buffer empty signal input terminal.
35	DLP	I	DLP signal input terminal.
36	ADR2	I	Address signal input terminals.
37	ADR1	I	
38	ADR0	I	
39	VPZ	O	VP signal output terminal.
40	SIC	O	SIC signal output terminal.

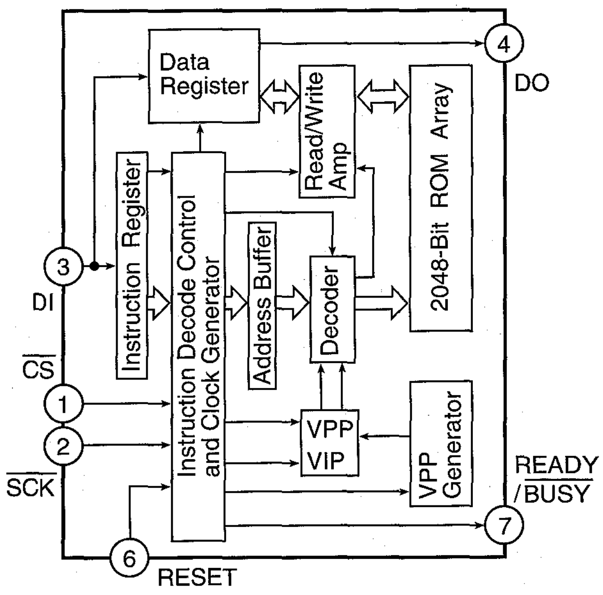
Pin	Name	I/O	Description
41	VCC	–	Power supply terminal.
42	GND	–	Ground terminal.
43	D7	I/O	DATA input/output terminals.
44	D6	I/O	
45	D5	I/O	
46	D4	I/O	
47	D3	I/O	
48	D2	I/O	
49	D1	I/O	
50	D0	I/O	
51	GND	–	Ground terminal.
52	IFFLD	O	IFFLD signal input terminal.
53	SYNC	I	SYNC signal input terminal.
54	INVO	O	INVO signal output terminal.
55	INVI	I	INVI signal input terminal.
56	DOUT	O	Data output terminal.
57	GND	–	Ground terminal.
58	VCC	–	Power supply terminal.
59	DIN	I	Data input terminal.
60	DGP3	O	DGP signal output terminals.
61	DGP2	O	
62	DGP1	O	
63	GND	–	Ground terminal.
64	OSCI	I	Oscillator signal input terminal.

3.2. IC8 on the Reveiver Board and IC7 on the Digital Board are using the 2k-bit EEPROM IC YWM6M 80021FP.

Description of this IC is as follows:

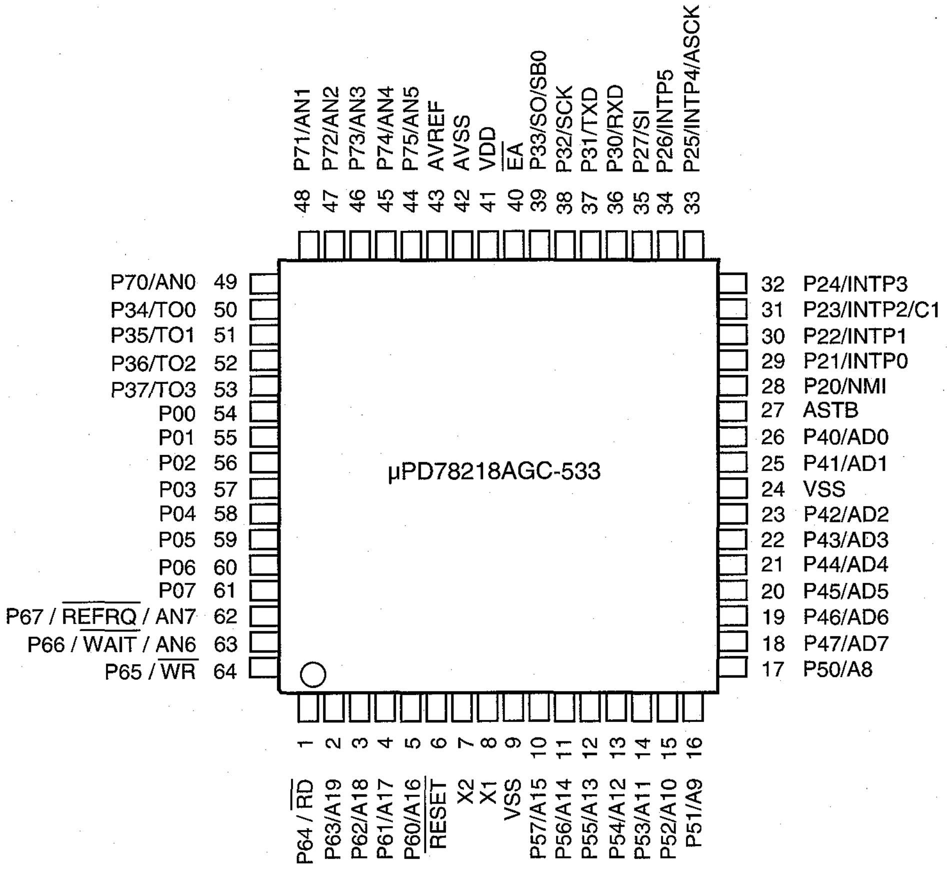

$\overline{\mathrm{CS}}$ 1
$\overline{\mathrm{SCK}}$ 2
DI 3
DO 4
8 VCC
7 READY/$\overline{\mathrm{BUSY}}$
6 RESET
5 VSS

(TOP VIEW)


Data Register
Read/Write Amp
2048-Bit ROM Array
Instruction Register
Instruction Decode Control and Clock Generator
Address Buffer
Decoder
VPP VIP
VPP Generator
4
DO
3
DI
$\overline{\mathrm{CS}}$
1
2
$\overline{\mathrm{SCK}}$
READY /$\overline{\mathrm{BUSY}}$
7
6
RESET

Pin	Name	I/O	Description
1	$\overline{\mathrm{CS}}$	I	Chip Select signal input terminal.
2	$\overline{\mathrm{SCK}}$	I	Serial Data Clock input terminal.
3	DI	I	Serial Data input terminal.
4	DO	O	Serial Data output terminal.
5	VSS	–	Ground terminal.
6	RESET	I	Reset signal input terminal.
7	READY /$\overline{\mathrm{BUSY}}$	O	Ready/$\overline{\mathrm{Busy}}$ signal output terminal.
8	VCC	–	Power supply terminal.

3.3. IC5 on the Receiver Board is using the 8-bit Single Chip Microprocessor IC YWD78218A533. Description of this IC is as follows:


µPD78218AGC-533
48 P71/AN1
47 P72/AN2
46 P73/AN3
45 P74/AN4
44 P75/AN5
43 AVREF
42 AVSS
41 VDD
40 $\overline{\text{EA}}$
39 P33/SO/SB0
38 P32/SCK
37 P31/TXD
36 P30/RXD
35 P27/SI
34 P26/INTP5
33 P25/INTP4/ASCK
49 P70/AN0
50 P34/TO0
51 P35/TO1
52 P36/TO2
53 P37/TO3
54 P00
55 P01
56 P02
57 P03
58 P04
59 P05
60 P06
61 P07
62 P67 / $\overline{\text{REFRQ}}$ / AN7
63 P66 / $\overline{\text{WAIT}}$ / AN6
64 P65 / $\overline{\text{WR}}$
32 P24/INTP3
31 P23/INTP2/C1
30 P22/INTP1
29 P21/INTP0
28 P20/NMI
27 ASTB
26 P40/AD0
25 P41/AD1
24 VSS
23 P42/AD2
22 P43/AD3
21 P44/AD4
20 P45/AD5
19 P46/AD6
18 P47/AD7
17 P50/A8
1 P64 / $\overline{\text{RD}}$
2 P63/A19
3 P62/A18
4 P61/A17
5 P60/A16
6 $\overline{\text{RESET}}$
7 X2
8 X1
9 VSS
10 P57/A15
11 P56/A14
12 P55/A13
13 P54/A12
14 P53/A11
15 P52/A10
16 P51/A9

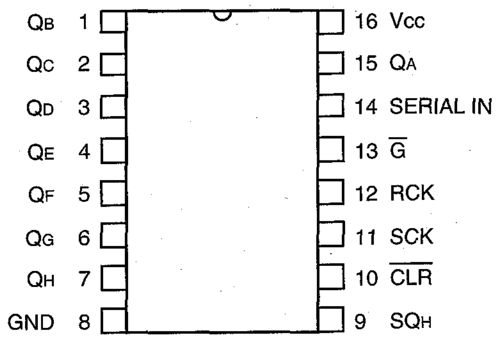
(TOP VIEW)

Pin	Name	I/O	Description
1	P64/$\overline{\text{RD}}$	O	Address signal output terminals. RD: Read Strobe signal output terminal.
2	P63/A19	O	
3	P62/A18	O	
4	P61/A17	O	
5	P60/A16	O	
6	$\overline{\text{RESET}}$	I	Reset signal input terminal.
7	X2	O	Crystal Oscillator output terminal.
8	X1	I	Crystal Oscillator input terminal.
9	VSS	–	Ground terminal.
10	P57/A15	O	Address signal output terminals.
11	P56/A14	O	
12	P63/A13	O	
13	P63/A12	O	
14	P63/A11	O	

Pin	Name	I/O	Description
15	P52/A10	O	Address signal output terminals.
16	P51/A9	O	
17	P50/A8	O	
18	P47/AD7	I/O	Address signal and DATA Bus terminals.
19	P46/AD6	I/O	
20	P45/AD5	I/O	
21	P44/AD4	I/O	
22	P43/AD3	I/O	
23	P42/AD2	I/O	
24	VSS	–	Ground terminal.
25	P41/AD1	I/O	Address signal and DATA Bus terminals.
26	P40/AD0	I/O	
27	ASTB	O	Address Strobe signal output terminal.
28	NMI	I	Non-markable Interrupt signal input terminal.

Pin	Name	I/O	Description
29	P21/INTP0	I	Interrupt signal input terminals. CI : Clock Input. ASCK: Asynchronous Serial Clock Input.
30	P22/INTP1	I	
31	P23/INTP2/CI	I	
32	P24/INTP3	I	
33	P25/INTP4/ASCK	I	
34	P26/INTP5	I	
35	P27/SI	I	Serial Data input terminal.
36	P30/RXD	I	Receive Data input terminal.
37	P31/TXD	O	Transmit Data output terminal.
38	P32/SCK	I/O	Serial Clock input/output terminal.
39	P33/SO/SB0	O	Serial Data output terminal.
40	$\overline{\text{EA}}$	I	External Access signal input terminal.
41	VDD	–	Power supply terminal.
42	AVSS	–	Ground terminal.
43	AVREF	I	Reference voltage supply terminal.
44	P75/AN5	I	Analog signal input terminals.
45	P74/AN4	I	
46	P73/AN3	I	
47	P72/AN2	I	
48	P71/AN1	I	
49	P70/AN0	I	
50	P34/TO0	O	Timer signal output terminals.
51	P35/TO1	O	
52	P36/TO2	O	
53	P37/TO3	O	
54	P00	O	Real-Time output terminals.
55	P01	O	
56	P02	O	
57	P03	O	
58	P04	O	
59	P05	O	
60	P06	O	
61	P07	O	
62	P67/$\overline{\text{REFRQ}}$/AN7	O	Reflesh Request signal output terminal.
63	P66/$\overline{\text{WAITE}}$/AN6	I	Wait signal input terminal.
64	P65/$\overline{\text{WR}}$	O	Write Strobe signal output terminal.

3.4. IC17 on the Receiver Board is using the 8-bit Shift Register with Output Latch IC MC74HC595AF. Description of this IC is as follows:



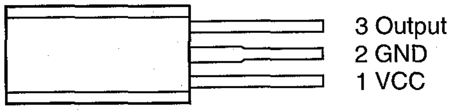
(TOP VIEW)

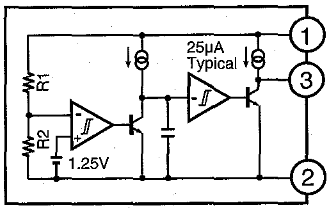
Truth Table

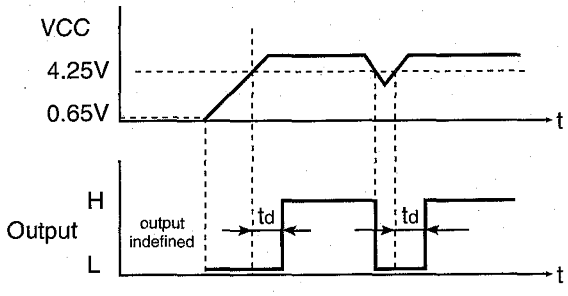
INPUTS				OUTPUTS	FUNCTION
$\overline{\text{CLR}}$	SCK	RCK	$\overline{\text{G}}$	Q	
H	↑	*	L	—	Right Shift
H	*	↑	L		Latch
⊔	*	*	*		Clear
*	*	*	H	Z	—

* : Don't care.
Z : High Impedance

3.5. IC9 and IC18 on the Receiver Board are using the Voltage Detector IC M51951ASL. Description of this IC is as follows:



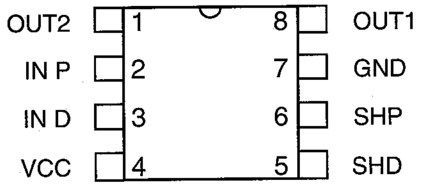




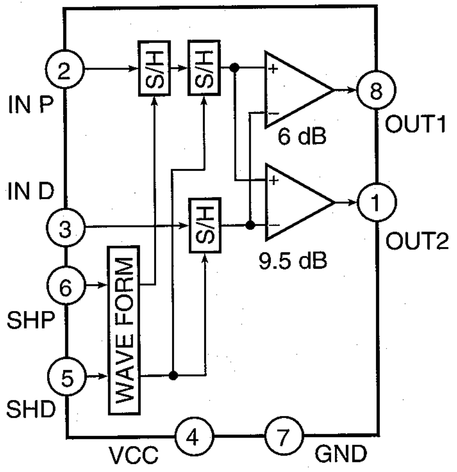
td ≈ 200μsec.

4. Drive Board

4.1. IC2 on the Drive Board is using the Correlated Double Sampling IC YWCXA1439M.
Description of this IC is as follows:

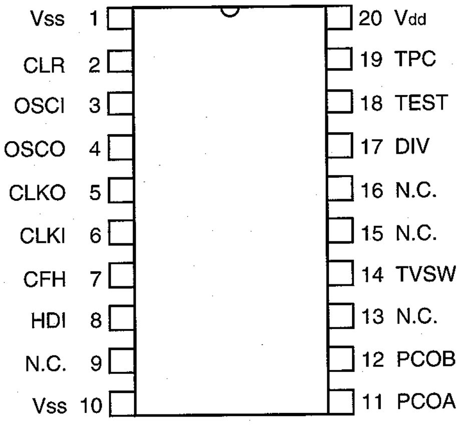

OUT2
IN P
IN D
VCC
1
2
3
4
8
7
6
5
OUT1
GND
SHP
SHD

(TOP VIEW)


2
IN P
IN D
3
6
SHP
5
SHD
S/H
S/H
S/H
WAVE FORM
+
−
6 dB
+
−
9.5 dB
8
OUT1
1
OUT2
4
VCC
7
GND

Pin	Name	I/O	Description
1	OUT 2	O	CDS signal (9.5 dB Gain) output terminal.
2	IN P	I	CCD signal input terminal.
3	IN D	I	CCD signal input terminal.
4	VCC	–	Power supply terminal.
5	SHD	I	Sample Hold Data Pulse input terminal. Active : High
6	SHP	I	Sample Hold Precharge Pulse input terminal. Active : High
7	GND	–	Ground terminal.
8	OUT1	O	CDS signal (6 dB Gain) output terminal.

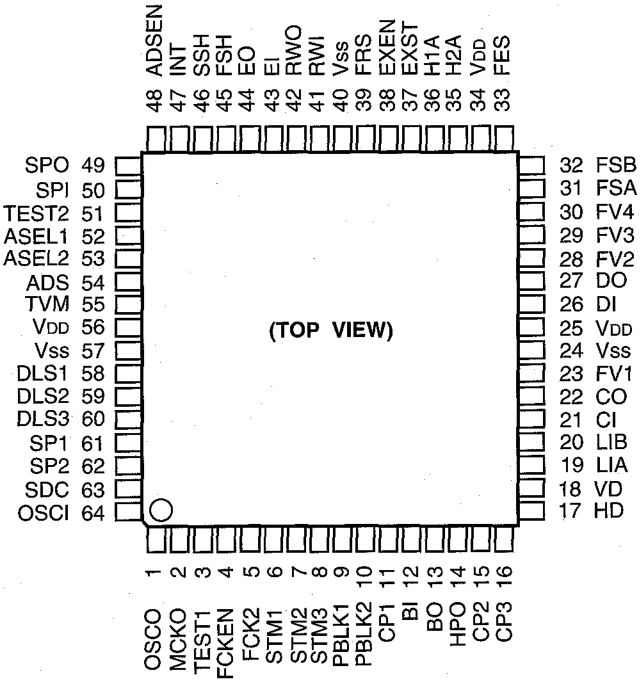
4.2. IC3 on the Drive Board is using the PLL IC MN53003 LBJ.
Description of this IC is as follows:


Vss 1
CLR 2
OSCI 3
OSCO 4
CLKO 5
CLKI 6
CFH 7
HDI 8
N.C. 9
Vss 10
20 Vdd
19 TPC
18 TEST
17 DIV
16 N.C.
15 N.C.
14 TVSW
13 N.C.
12 PCOB
11 PCOA

(TOP VIEW)

Pin	Name	I/O	Description
1	Vss	–	Ground terminal.
2	CLR	I	CLR signal input terminal.
3	OSCI	I	Oscillator signal input terminal.
4	OSCO	O	Oscillator signal output terminal.
5	CLKO	O	Clock Pulse output terminal.
6	CLKI	I	Clock Pulse input terminal.
7	CFH	O	CFH signal output terminal.
8	HDI	I	HD signal input terminal.
9	N.C.	–	Non connection.
10	Vss	–	Ground terminal.
11	PCOA	O	PCOA signal output terminal.
12	PCOB	O	PCOB signal output terminal.
13	N.C.	–	Non connection.
14	TVSW	O	TVSW signal output terminal.
15	N.C.	–	Non connection.
16	N.C.	–	Non connection.
17	DIV	I	DIV signal input terminal.
18	TEST	I	Test signal input terminal.
19	TPC	I	TPC signal input terminal.
20	Vdd	–	Power supply terminal.

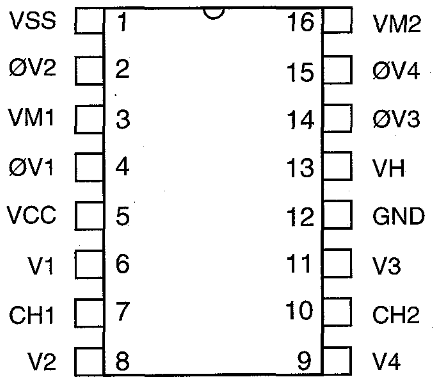
4.3. IC6 on the Drive Board is using the Drive Pulse Generator Gate Array Logic IC YWMB621488U.
Description of this IC is as follows:


48 ADSEN
47 INT
46 SSH
45 FSH
44 EO
43 EI
42 RWO
41 RWI
40 Vss
39 FRS
38 EXEN
37 EXST
36 H1A
35 H2A
34 VDD
33 FES
SPO 49
SPI 50
TEST2 51
ASEL1 52
ASEL2 53
ADS 54
TVM 55
VDD 56
Vss 57
DLS1 58
DLS2 59
DLS3 60
SP1 61
SP2 62
SDC 63
OSCI 64
(TOP VIEW)
32 FSB
31 FSA
30 FV4
29 FV3
28 FV2
27 DO
26 DI
25 VDD
24 Vss
23 FV1
22 CO
21 CI
20 LIB
19 LIA
18 VD
17 HD
1 OSCO
2 MCKO
3 TEST1
4 FCKEN
5 FCK2
6 STM1
7 STM2
8 STM3
9 PBLK1
10 PBLK2
11 CP1
12 BI
13 BO
14 HPO
15 CP2
16 CP3

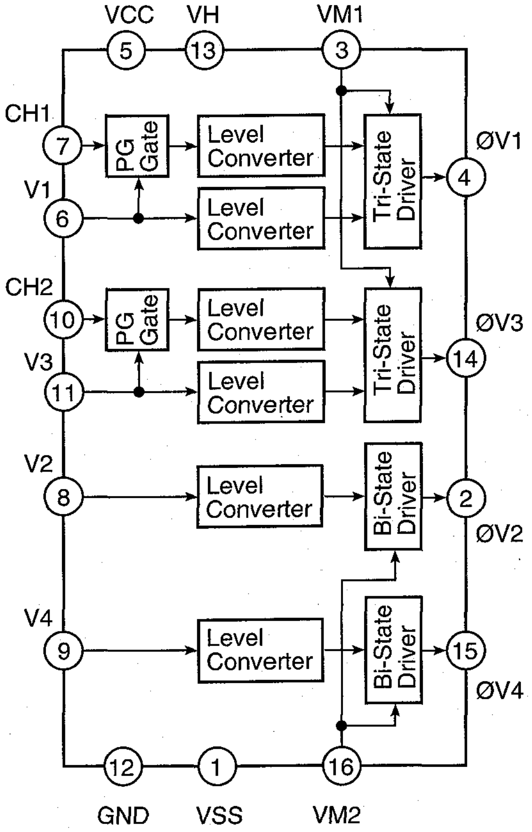
Pin	Name	I/O	Description
1	OSCO	O	Crystal oscillator output terminal.
2	MCKO	O	MCKO signal output terminal.
3	TEST1	I	Test signal Input terminal.
4	FCKN	I	FCKN signal input terminal.
5	FCK2	O	FCK2 signal output terminal.
6	STM1	I	STM1 signal input terminal.
7	STM2	I	STM2 signal input terminal.
8	STM3	I	STM3 signal input terminal.
9	PBLK1	O	Pre-Blanking signal output terminal.
10	PBLK2	O	Pre-Blanking signal output terminal.
11	CP1	O	Clamp Pulse output terminal.
12	BI	I	BI signal input terminal.
13	BO	O	BO signal output terminal.
14	HPO	O	HPO signal output terminal.
15	CP2	O	Clamp Pulse output terminal.
16	CP3	O	Clamp Pulse output terminal.
17	HD	I	HD signal input terminal.
18	VD	I	VD signal input terminal.
19	LIA	O	LIA signal output terminal.
20	LIB	O	LIB signal output terminal.
21	CI	I	CI signal input terminal.
22	CO	O	CO signal output terminal.
23	FV1	O	FV1 signal output terminal.
24	Vss	–	Ground terminal.
25	VDD	–	Power supply terminal.
26	DI	I	Data input terminal.
27	DO	O	Data output terminal.
28	FV2	O	FV2 signal output terminal.
29	FV3	O	FV3 signal output terminal.
30	FV4	O	FV4 signal output terminal.
31	FSA	O	FSA signal output terminal.
32	FSB	O	FSB signal output terminal.
33	FES	O	FES signal output terminal.
34	VDD	–	Power supply terminal.
35	H2A	O	H2A signal output terminal.
36	H1A	O	H1A signal output terminal.
37	EXST	I	EXST signal input terminal.
38	EXEN	I	EXEN signal input terminal.
39	FRS	O	FRS signal output terminal.
40	Vss	–	Ground terminal.
41	RWI	I	Read/Write signal input terminal.
42	RWO	O	Read/Write signal output terminal.
43	EI	I	EI signal input terminal.
44	EO	O	EO signal output terminal.
45	FHS	O	FHS signal output terminal.
46	SSH	O	SSH signal output terminal.
47	INT	I	INT signal input terminal.
48	ADSEN	I	ADSEN signal input terminal.
49	SPO	O	SP signal output terminal.
50	SPI	I	SP signal input terminal.
51	TEST2	I	Test signal input terminal.
52	ASEL1	I	ASEL1 signal input terminal.
53	ASEL2	I	ASEL2 signal input terminal.
54	ADS	O	ADS signal output terminal.
55	TVM	I	TVM signal input terminal.
56	VDD	–	Power supply terminal.
57	Vss	–	Ground terminal.
58	DLS1	I	DLS1 signal input terminal.
59	DLS2	I	DLS2 signal input terminal.
60	INPM	I	INPM signal input terminal.
61	SP1	O	SP1 signal output terminal.
62	SP2	O	SP2 signal output terminal.
63	SDC	I	SDC signal input terminal.
64	OSCI	I	Crystal oscillator input terminal.

4.6. IC7 on the Drive Board is using the CCD Vertical Drive IC YWUPD16501GS.

Description of this IC is as follows:


VSS
ØV2
VM1
ØV1
VCC
V1
CH1
V2
1
2
3
4
5
6
7
8
16
15
14
13
12
11
10
9
VM2
ØV4
ØV3
VH
GND
V3
CH2
V4

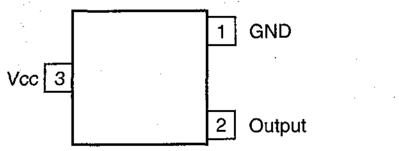
(TOP VIEW)

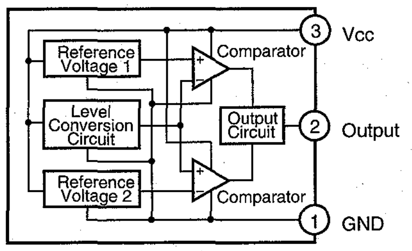

VCC
VH
VM1
5
13
3
CH1
7
PG Gate
Level Converter
V1
6
Level Converter
Tri-State Driver
4
ØV1
CH2
10
PG Gate
Level Converter
V3
11
Level Converter
Tri-State Driver
14
ØV3
V2
8
Level Converter
Bi-State Driver
2
ØV2
V4
9
Level Converter
Bi-State Driver
15
ØV4
12
1
16
GND
VSS
VM2

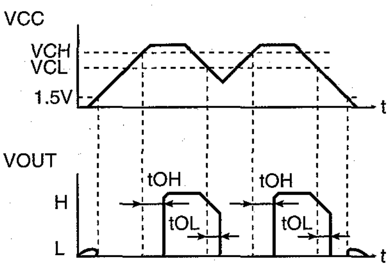
Pin	Name	I/O	Description
1	VSS	–	Negative Voltage supply terminal.
2	ØV2	O	Bi-State output terminal 1.
3	VM1	–	Middle Voltage supply terminal for Tri-State Drivers.
4	ØV1	O	Tri-State input terminal 1.
5	VCC	–	Power supply for input circuit section.
6	V1	I	Tri-State input terminal 1.
7	CH1	I	Photodiode Gate input terminal 1.
8	V2	I	Bi-State input terminal 1.
9	V4	I	Bi-State input terminal 2.
10	CH2	I	Photodiode Gate input terminal 2.
11	V3	I	Tri-State input terminal 2.
12	GND	–	Ground terminal.
13	VH	–	High Voltage supply terminal for Tri-State Drivers.
14	ØV3	O	Tri-State input terminal 2.
15	ØV4	O	Bi-State output terminal 2.
16	VM2	–	Middle Voltage supply terminal for Bi-State Drivers.

4.7. IC8 and IC9 on the Drive Board are using the 3.5V Reset IC MN13821P.

Description of this IC is as follows:

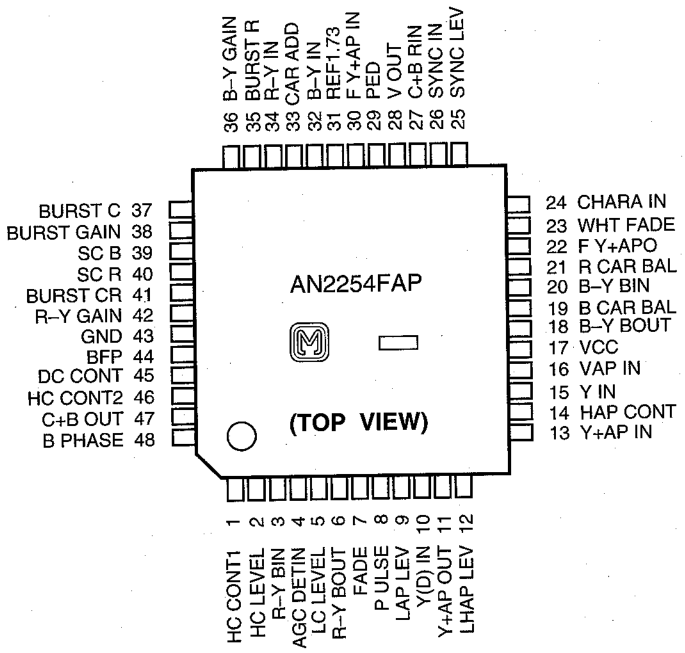

1
GND
Vcc
3
2
Output


Reference Voltage 1
Comparator
3
Vcc
Level Conversion Circuit
Output Circuit
2
Output
Reference Voltage 2
Comparator
1
GND


VCC
VCH
VCL
1.5V
t
VOUT
H
L
tOH
tOL
tOH
tOL
t

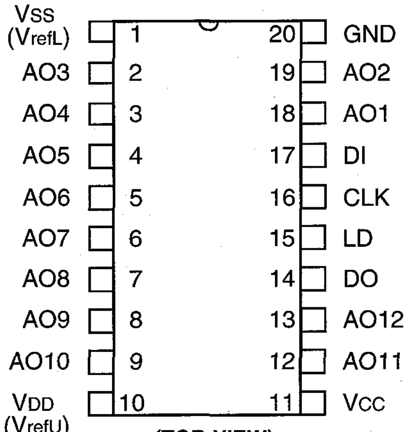
5. Sync/Encoder Board

5.1. IC4 on the Sync/Encoder Board is using the Video Signal Encoder IC AN2254FAP.
Description of this IC is as follows:


36 B–Y GAIN
35 BURST R
34 R–Y IN
33 CAR ADD
32 B–Y IN
31 REF1.73
30 F Y+AP IN
29 PED
28 V OUT
27 C+B RIN
26 SYNC IN
25 SYNC LEV
BURST C 37
BURST GAIN 38
SC B 39
SC R 40
BURST CR 41
R–Y GAIN 42
GND 43
BFP 44
DC CONT 45
HC CONT2 46
C+B OUT 47
B PHASE 48
AN2254FAP
(TOP VIEW)
24 CHARA IN
23 WHT FADE
22 F Y+APO
21 R CAR BAL
20 B–Y BIN
19 B CAR BAL
18 B–Y BOUT
17 VCC
16 VAP IN
15 Y IN
14 HAP CONT
13 Y+AP IN
1 HC CONT1
2 HC LEVEL
3 R–Y BIN
4 AGC DETIN
5 LC LEVEL
6 R–Y BOUT
7 FADE
8 PULSE
9 LAP LEV
10 Y(D) IN
11 Y+AP OUT
12 LHAP LEV

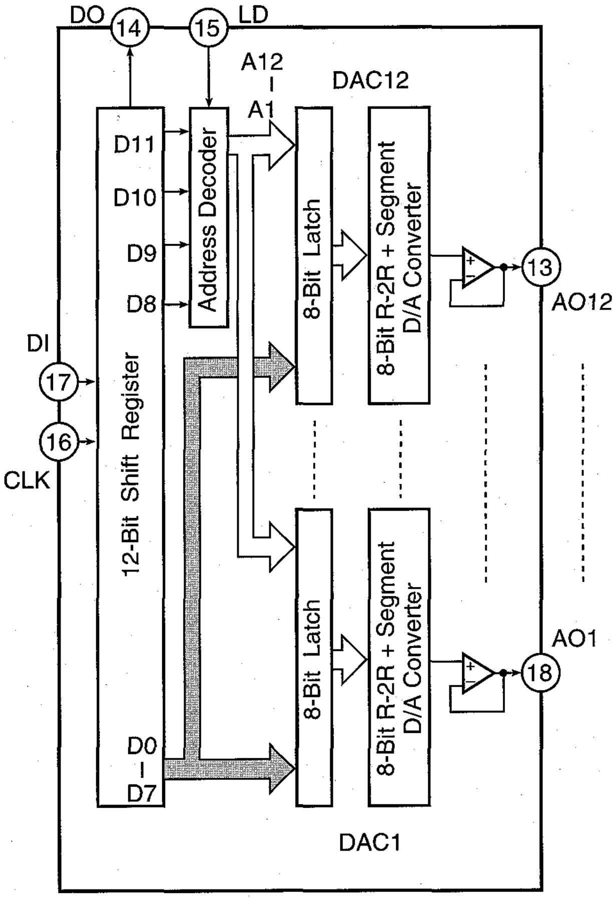
Pin	Name	I/O	Description
1	HC CONT1	I	High Chroma Control 1 signal input terminal.
2	HC LEVEL	I	High Chroma Control Level adjustment terminal.
3	R–Y BIN	I	R–Y Buffer input terminal.
4	AGC DET IN	I	AGC Detector DC input terminal.
5	LC LEVEL	I	Low Chroma Control Level adjustment terminal.
6	R–Y BOUT	O	R–Y Buffer output terminal.
7	FADE	I	Fade Control signal input terminal.
8	PULSE	I	CP, WHD and BLK Pulses input terminal. CP2 : 3.5V WHD : 2.0V C. BLK : 1.0V
9	LAP LEV	O	Low Luminance Aperture Control Level adjustment terminal.
10	Y(D) IN	I	YH delayed signal input terminal.
11	Y+AP OUT	O	Luminance and Aperture signals output terminal.
12	LHAP LEV	O	Horizontal Aperture Low Level Clip adjustment terminal.
13	Y+AP IN	I	Luminance and Aperture signals input terminal.
14	HAP CONT	I	Horizontal Aperture Gain adjustment terminal.
15	Y IN	I	YH (through) signal input terminal.
16	VAP IN	I	Vertical Aperture signal input terminal.
17	VCC	–	Power supply terminal.
18	B–Y BOUT	O	B–Y Buffer output terminal.
19	B CAR BAL	I	B–Y Carrier Balance adjustment terminal.
20	B–Y BIN	I	B–Y Buffer input terminal.
21	R CAR BAL	I	R–Y Carrier Balance adjustment terminal.
22	F Y+APO	O	Faded Luminance and Aperture signal output terminal.
23	WHT FADE	I	White Fade adjustment terminal.
24	CHARA IN	I	Character input terminal.
25	SYNC LEV	I	Sync signal Gain control terminal.
26	SYNC IN	I	Sync signal input terminal.
27	C+B RIN	I	Chroma and Burst signal input terminal.
28	V OUT	O	Video signal output terminal.
29	PED	I	Pedestal adjustment terminal.
30	F Y+AP IN	I	Faded Luminance and Aperture signals input terminal.
31	REF1.73	O	Reference Voltage output terminal (1.73V typ.)
32	B–Y IN	I	B–Y signal input terminal.
33	CAR ADD	I	Carrier Add adjustment terminal.
34	R–Y IN	I	R–Y signal input terminal.
35	BURST R	–	Resistor connecting terminal for Burst circuit.
36	B–Y Gain	I	B–Y Gain control terminal.
37	BURST C	–	Capacitor connecting terminal for Burst circuit.
38	BURST GAIN	I	Burst Gain control terminal.
39	SC B	I	Sub Carrier B input terminal.
40	SC R	I	Sub Carrier B input terminal.
41	BURST CR	–	Capacitor and Resistor connecting terminal for Burst circuit.
42	R–Y Gain	I	R–Y Gain control terminal.
43	GND	–	Ground terminal.
44	BFP	I	BFP signal input terminal.
45	DC CONT	–	DC Bias control terminal.
46	HC CONT2	I	High Chroma Control 2 signal input terminal.
47	C+B OUT	O	Chroma and Burst signals output terminal.
48	B PHASE	I	Burst Phase adjustment terminal.

5.2. IC5 on the Sync/Encoder Board is using the 8-Bit D/A Converter IC YWM62352GP.
Description of this IC is as follows:

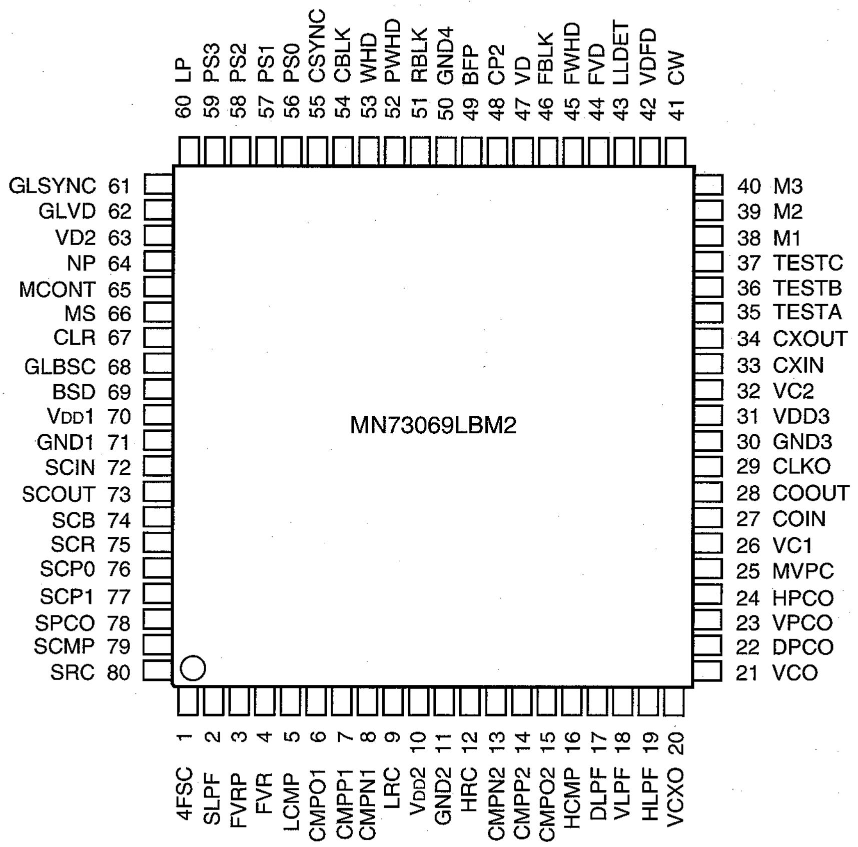

Vss (VrefL) 1
AO3 2
AO4 3
AO5 4
AO6 5
AO7 6
AO8 7
AO9 8
AO10 9
VDD (VrefU) 10
20 GND
19 AO2
18 AO1
17 DI
16 CLK
15 LD
14 DO
13 AO12
12 AO11
11 Vcc

(TOP VIEW)

Pin	Name	I/O	Description
1	Vss (VrefL)	–	Lower reference voltage supply terminal for D/A Converter circuit.
2	AO3	O	Analog Data 3 output terminal.
3	AO4	O	Analog Data 4 output terminal.
4	AO5	O	Analog Data 5 output terminal.
5	AO6	O	Analog Data 6 output terminal.
6	AO7	O	Analog Data 7 output terminal.
7	AO8	O	Analog Data 8 output terminal.
8	AO9	O	Analog Data 9 output terminal.
9	AO10	O	Analog Data 10 output terminal.
10	VDD (VrefU)	–	Upper reference voltage supply terminal for D/A Converter circuit.
11	Vcc	–	Power supply terminal terminal.
12	AO11	O	Analog Data 11 output terminal.
13	AO12	O	Analog Data 12 output terminal.
14	DO	O	MSB Data output terminal from 12-Bit Shift Register.
15	LD	I	Load signal input terminal. Data of 12-Bit Shift Register should be loaded to Decoder and D/A Output Registers when LD = H.
16	CLK	I	Shift Clock input terminal. Serial Data from DI terminal should be input to Decoder and 12-Bit Shift Register at raising edge of this signal.
17	DI	I	12-Bit Serial Data input terminal.
18	AO1	O	Analog Data 1 output terminal.
19	AO2	O	Analog Data 2 output terminal.
20	GND	–	Ground terminal.


DO
14
15
LD
A12
A1
DAC12
D11
D10
D9
D8
Address Decoder
8-Bit Latch
8-Bit R-2R + Segment D/A Converter
13
AO12
DI
17
16
CLK
12-Bit Shift Register
8-Bit Latch
8-Bit R-2R + Segment D/A Converter
AO1
18
D0
D7
DAC1

5.3. IC7 on the Sync/Encoder Board is using the Sync Signal Generator IC MN73069LBM2. Description of this IC is as follows:


60 LP
59 PS3
58 PS2
57 PS1
56 PS0
55 CSYNC
54 CBLK
53 WHD
52 PWHD
51 RBLK
50 GND4
49 BFP
48 CP2
47 VD
46 FBLK
45 FWHD
44 FVD
43 LLDET
42 VDFD
41 CW
GLSYNC 61
GLVD 62
VD2 63
NP 64
MCONT 65
MS 66
CLR 67
GLBSC 68
BSD 69
VDD1 70
GND1 71
SCIN 72
SCOUT 73
SCB 74
SCR 75
SCP0 76
SCP1 77
SPCO 78
SCMP 79
SRC 80
MN73069LBM2
40 M3
39 M2
38 M1
37 TESTC
36 TESTB
35 TESTA
34 CXOUT
33 CXIN
32 VC2
31 VDD3
30 GND3
29 CLKO
28 COOUT
27 COIN
26 VC1
25 MVPC
24 HPCO
23 VPCO
22 DPCO
21 VCO
1 4FSC
2 SLPF
3 FVRP
4 FVR
5 LCMP
6 CMPO1
7 CMPP1
8 CMPN1
9 LRC
10 VDD2
11 GND2
12 HRC
13 CMPN2
14 CMPP2
15 CMPO2
16 HCMP
17 DLPF
18 VLPF
19 HLPF
20 VCXO

(TOP VIEW)

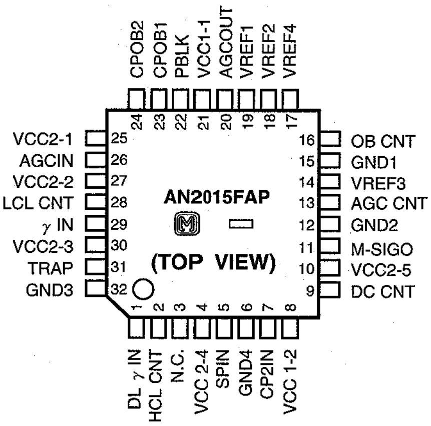
Pin	Name	I/O	Description
1	4FSC	O	4FSC signal output terminal.
2	SLPF	I	SLPF signal input terminal.
3	FVRP	I	FVRP signal input terminal.
4	FVR	I	FVR signal input terminal.
5	LCMP	I	LCMP signal input terminal.
6	CMPO1	O	CMPO1 signal output terminal.
7	CMPP1	O	CMPP1 signal output terminal.
8	CMPN1	O	CMPN1 signal output terminal.
9	LRC	O	LRC signal output terminal.
10	VDD2	–	+5V supply terminal.
11	GND2	–	Ground terminal.
12	HRC	O	HRC signal output terminal.
13	CMPN2	O	CMPN2 signal output terminal.
14	CMPP2	O	CMPP2 signal output terminal.
15	CMPO2	O	CMPO2 signal output terminal.
16	HCMP	I	HCMP signal input terminal.
17	DLPF	I	DLPF signal input terminal.
18	VLPF	I	VLPF signal input terminal.
19	HLPF	I	HLPF signal input terminal.
20	VCXO	O	VCXO signal output terminal.
21	VCO	O	VCO signal output terminal.
22	DPCO	O	DPCO signal output terminal.

Pin	Name	I/O	Description
23	VPCO	O	VPCO signal input terminal.
24	HPCO	O	HPCO signal input terminal.
25	MVPC	I	MVPC signal input terminal.
26	VC1	O	VC1 signal input terminal.
27	COIN	I	CO signal input terminal.
28	COOUT	O	CO signal output terminal.
29	CLKO	O	Clock Pulse output terminal.
30	GND3	–	Ground terminal.
31	VDD3	–	+5V supply terminal.
32	VC2	O	VC2 signal input terminal.
33	CXIN	I	CX signal input terminal.
34	CXOUT	O	CX signal output terminal.
35	TESTA	I	TESTA signal input terminal.
36	TESTB	I	TESTB signal input terminal.
37	TESTC	I	TESTC signal input terminal.
38	M1	O	M1 signal output terminal.
39	M2	O	M2 signal output terminal.
40	M3	O	M3 signal output terminal.
41	CW	I	CW signal input terminal.
42	VDFD	I	VDFD signal input terminal.
43	LLDET	I	LL Detect signal input terminal.
44	FVD	O	FVD signal output terminal.
45	FWHD	O	FWHD signal output terminal.
46	FBLK	O	FBLK signal output terminal.
47	VD	O	VD signal output terminal.
48	CP2	O	Clamp Pulse output terminal.
49	BF	O	BF signal output terminal.
50	GND4	–	Ground terminal.
51	RBLK	I	Pre-Blanking signal input terminal.
52	RWHD	I	RWHD signal input terminal.
53	WHD	O	WHD signal output terminal.
54	CBLK	O	Composite Blanking signal output terminal.
55	CSYNC	O	Composite Sync signal output terminal.
56	PS0	I	PS0 signal output terminal.
57	PS1	I	PS1 signal output terminal.
58	PS2	I	PS2 signal output terminal.
59	PS3	I	PS3 signal output terminal.
60	LP	I	LP signal output terminal.
61	GLSYNC	I	GLSYNC signal output terminal.
62	GLVD	I	GLVD signal input terminal.
63	VD2	I	VD2 signal input terminal.

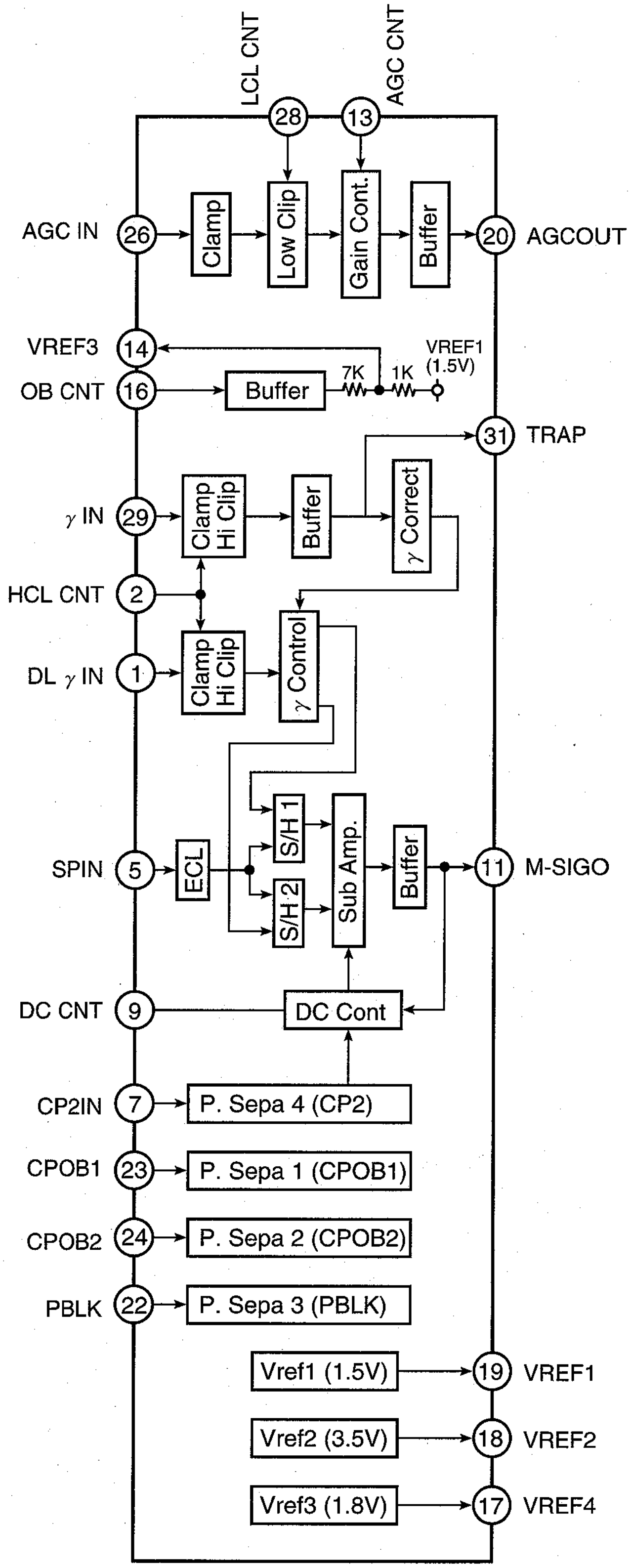
Pin	Name	I/O	Description
64	NP	I	NTSC/PAL switching signal input terminal. H = NTSC L = PAL
65	MCONT	I	MCONT signal input terminal.
66	MS	I	MS signal input terminal.
67	CLR	I	CLR signal input terminal.
68	GLBSC	I	GLBSC signal input terminal.
69	BSD	I	Burst Detect signal input terminal.
70	VDD1	–	+5V supply terminal.
71	GND1	–	Ground terminal.
72	SCIN	I	SC signal input terminal.
73	SCOUT	O	SC signal output terminal.
74	SCB	O	SCB signal output terminal.
75	SCR	O	SCR signal output terminal.
76	SCP0	I	SCP0 signal input terminal.
77	SCP1	I	SCP1 signal input terminal.
78	SPCO	O	SPCO signal output terminal.
79	SCMP	I	SCMP signal output terminal.
80	SRC	O	SRC signal output terminal.

6. Digital Board

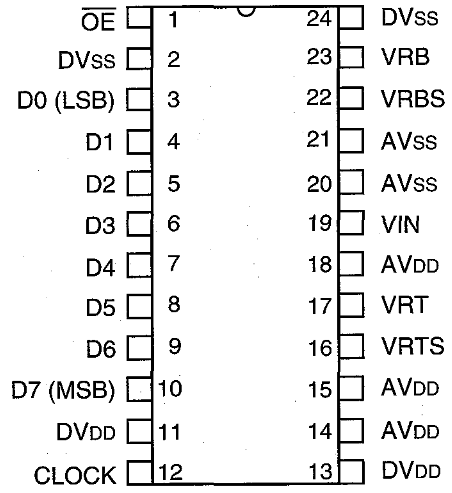
6.1. IC1 on the Digital Board is using the AGC Gamma Correction IC AN2015FAP.
Description of this IC is as follows:


CPOB2
CPOB1
PBLK
VCC1-1
AGCOUT
VREF1
VREF2
VREF4
24
23
22
21
20
19
18
17
VCC2-1 25
AGCIN 26
VCC2-2 27
LCL CNT 28
γ IN 29
VCC2-3 30
TRAP 31
GND3 32
16 OB CNT
15 GND1
14 VREF3
13 AGC CNT
12 GND2
11 M-SIGO
10 VCC2-5
9 DC CNT
AN2015FAP
(TOP VIEW)
1
2
3
4
5
6
7
8
DL γ IN
HCL CNT
N.C.
VCC 2-4
SPIN
GND4
CP2IN
VCC 1-2

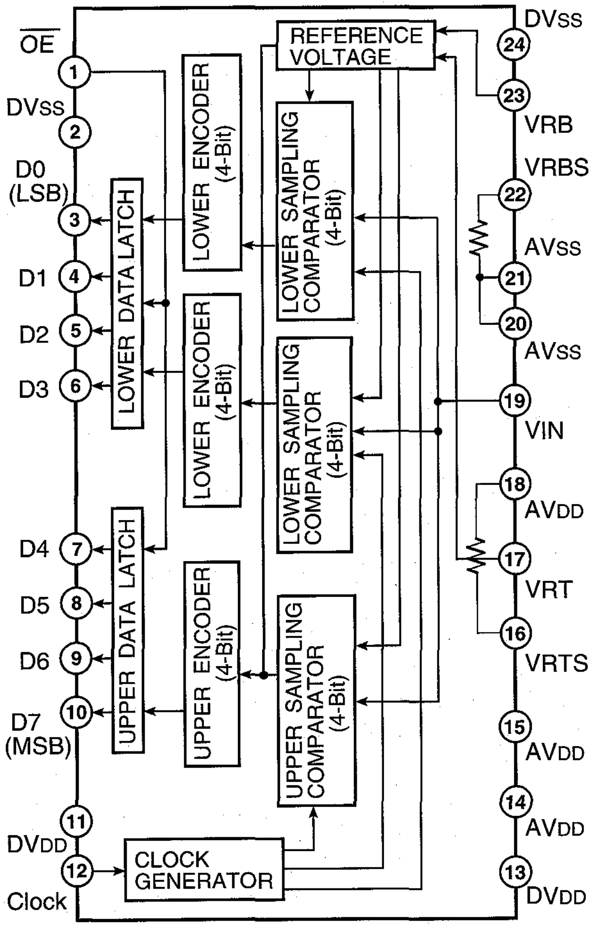
Pin	Name	I/O	Description
1	DL γ IN	I	Delayed γ Correction input terminal.
2	HCL CNT	I	Hi Clip Level Control terminal.
3	N.C.	–	Non connection.
4	VCC2-4	–	Power (4.5V typ.) supply terminal.
5	SPIN	I	Sampling Pulse input terminal.
6	GND4	–	Ground terminal.
7	CP2IN	I	CP2 Pulse input terminal.
8	VCC1-2	–	Power (8.5V typ.) supply terminal.
9	DC CNT	I	DC control terminal.
10	VCC2-5	–	Power (4.5V typ.) supply terminal.
11	M-SIGO	O	Main signal output terminal.
12	GND2	–	Ground terminal.
13	AGC CNT	I	AGC control terminal.
14	VREF3	O	Vartiable reference voltage output terminal.
15	GND1	–	Ground terminal.
16	OB CNT	I	OB signal level control terminal.
17	VREF4	O	1.8V (typ.) reference voltage output terminal.
18	VREF2	O	3.5V (typ.) reference voltage output terminal.
19	VREF1	O	1.5V (typ.) reference voltage output terminal.
20	AGCOUT	O	AGC signal output terminal.
21	VCC1-1	–	Power (8.5V typ.) supply terminal.
22	PBLK	I	Pre-Blanking signal input terminal.
23	CPOB1	I	OB Clamp signal input terminal.
24	CPOB2	I	OB Clamp signal input terminal.
25	VCC2-1	–	Power (4.5V typ.) supply terminal.
26	AGC IN	I	AGC signal input terminal.
27	VCC2-2	–	Power (4.5V typ.) supply terminal.
28	LCL CNT	I	Low Clip Level Control terminal.
29	γ IN	I	Gamma Correction input terminal.
30	VCC2-3	–	Power (4.5V typ.) supply terminal.
31	TRAP	O	TRAP signal output terminal.
32	GND3	–	Ground terminal.


LCL CNT
AGC CNT
28
13
AGC IN
26
Clamp
Low Clip
Gain Cont.
Buffer
20
AGCOUT
VREF3
14
VREF1
(1.5V)
7K
1K
OB CNT
16
Buffer
31
TRAP
γ IN
29
Clamp
Hi Clip
Buffer
γ Correct
HCL CNT
2
DL γ IN
1
Clamp
Hi Clip
γ Control
S/H 1
S/H 2
Sub Amp.
Buffer
SPIN
5
ECL
11
M-SIGO
DC CNT
9
DC Cont
CP2IN
7
P. Sepa 4 (CP2)
CPOB1
23
P. Sepa 1 (CPOB1)
CPOB2
24
P. Sepa 2 (CPOB2)
PBLK
22
P. Sepa 3 (PBLK)
Vref1 (1.5V)
19
VREF1
Vref2 (3.5V)
18
VREF2
Vref3 (1.8V)
17
VREF4

6.2. IC6 on the Digital Board is using the 8-Bit A/D Converter IC YWCXD1175AM.
Description of this IC is as follows:

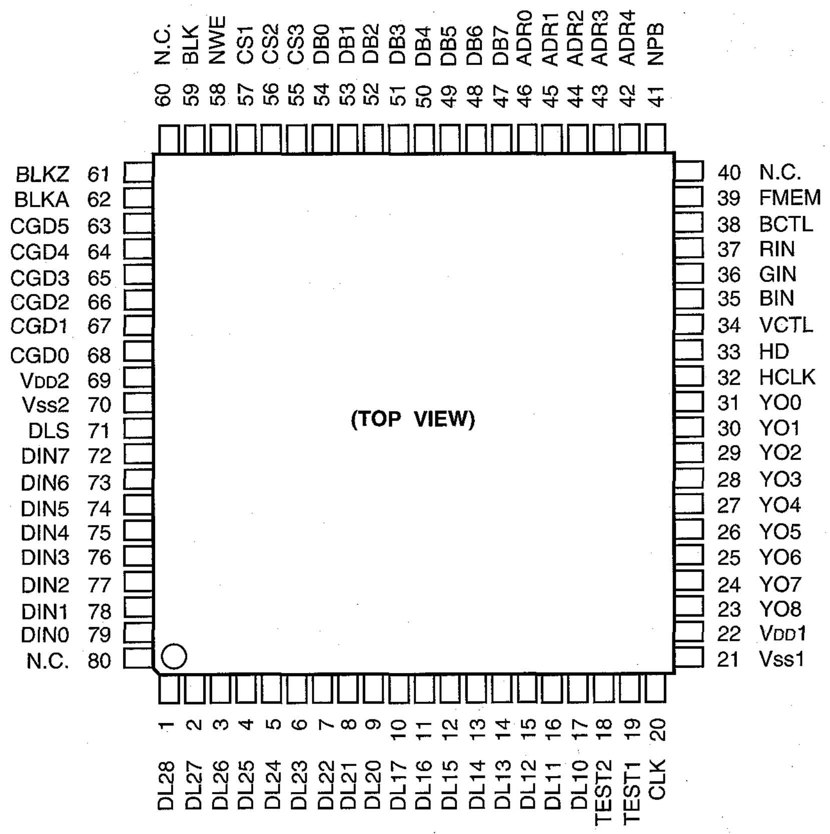

$\overline{\text{OE}}$
1
DVss
2
D0 (LSB)
3
D1
4
D2
5
D3
6
D4
7
D5
8
D6
9
D7 (MSB)
10
DVDD
11
CLOCK
12
24
DVss
23
VRB
22
VRBS
21
AVss
20
AVss
19
VIN
18
AVDD
17
VRT
16
VRTS
15
AVDD
14
AVDD
13
DVDD

(TOP VIEW)


$\overline{\text{OE}}$
1
DVss
2
D0 (LSB)
3
D1
4
D2
5
D3
6
D4
7
D5
8
D6
9
D7 (MSB)
10
11
DVDD
12
Clock
REFERENCE VOLTAGE
LOWER ENCODER (4-Bit)
LOWER ENCODER (4-Bit)
UPPER ENCODER (4-Bit)
LOWER DATA LATCH
UPPER DATA LATCH
LOWER SAMPLING COMPARATOR (4-Bit)
LOWER SAMPLING COMPARATOR (4-Bit)
UPPER SAMPLING COMPARATOR (4-Bit)
CLOCK GENERATOR
24
DVss
23
VRB
22
VRBS
21
AVss
20
AVss
19
VIN
18
AVDD
17
VRT
16
VRTS
15
AVDD
14
AVDD
13
DVDD

Pin	Name	I/O	Description
1	$\overline{\text{OE}}$	I	Output Enable signal input terminal.
2	DVSS	–	Ground terminal for Digital Circuit.
3	D0	O	Digital Data D0 (LSB) output terminal.
4	D1	O	Digital Data D1 (2nd.) output terminal.
5	D2	O	Digital Data D2 (3rd.) output terminal.
6	D3	O	Digital Data D3 (4th.) output terminal.
7	D4	O	Digital Data D4 (5th.) output terminal.
8	D5	O	Digital Data D5 (6th.) output terminal.
9	D6	O	Digital Data D6 (7th.) output terminal.
10	D7	O	Digital Data D7 (MSB) output terminal.
11	DVDD	–	Power supply terminal for Digital Circuit.
12	CLOCK	I	Clock input terminal.
13	DVDD	–	Power supply terminal for Digital Circuit.
14	AVDD	–	Power supply terminal for Analog Circuit.
15	AVDD	–	Power supply terminal for Analog Circuit.
16	VRTS	O	Top Voltage output terminal.
17	VRT	I	Top Voltage input terminal.
18	AVDD	–	Power supply terminal for Analog Circuit.
19	VIN	I	Analog signal input terminal.
20	AVSS	–	Ground terminal for Analog Circuit.
21	AVSS	–	Ground terminal for Analog Circuit.
22	VRBS	O	Bottom Voltage output terminal.
23	VRB	I	Bottom Voltage input terminal.
24	DVSS	–	Ground terminal for Digital Circuit.

6.3. IC8 on the Digital Board is using the Y Digital Signal Processor IC MN6730FHP.
Description of this IC is as follows:

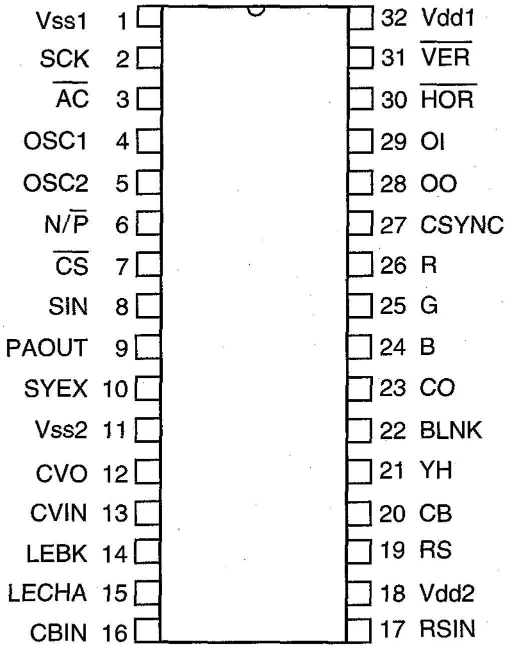

60 N.C.
59 BLK
58 NWE
57 CS1
56 CS2
55 CS3
54 DB0
53 DB1
52 DB2
51 DB3
50 DB4
49 DB5
48 DB6
47 DB7
46 ADR0
45 ADR1
44 ADR2
43 ADR3
42 ADR4
41 NPB
BLKZ 61
BLKA 62
CGD5 63
CGD4 64
CGD3 65
CGD2 66
CGD1 67
CGD0 68
VDD2 69
Vss2 70
DLS 71
DIN7 72
DIN6 73
DIN5 74
DIN4 75
DIN3 76
DIN2 77
DIN1 78
DIN0 79
N.C. 80
(TOP VIEW)
40 N.C.
39 FMEM
38 BCTL
37 RIN
36 GIN
35 BIN
34 VCTL
33 HD
32 HCLK
31 YO0
30 YO1
29 YO2
28 YO3
27 YO4
26 YO5
25 YO6
24 YO7
23 YO8
22 VDD1
21 Vss1
1 DL28
2 DL27
3 DL26
4 DL25
5 DL24
6 DL23
7 DL22
8 DL21
9 DL20
10 DL17
11 DL16
12 DL15
13 DL14
14 DL13
15 DL12
16 DL11
17 DL10
18 TEST2
19 TEST1
20 CLK

Pin	Name	I/O	Description
1	DL28	O	DL signal output terminals.
2	DL27	O	
3	DL26	O	
4	DL25	O	
5	DL24	O	
6	DL23	O	
7	DL22	O	
8	DL21	O	
9	DL20	O	
10	DL17	O	
11	DL16	O	
12	DL15	O	
13	DL14	O	
14	DL13	O	
15	DL12	O	
16	DL11	O	
17	DL10	O	
18	TEST2	I	Test 2 input terminal.

Pin	Name	I/O	Description
19	TEST1	I	Test 1 input terminal.
20	CLK	I	Clock Pulse input terminal.
21	Vss1	–	Ground terminal.
22	VDD1	–	Power supply terminal.
23	YO8	O	Luminance signal data output terminals. (8-Bit)
24	YO7	O	
25	YO6	O	
26	YO5	O	
27	YO4	O	
28	YO3	O	
29	YO2	O	
30	YO1	O	
31	YO0	O	
32	HCLK	I	HCLK signal input terminal.
33	HD	I	HD signal input terminal.
34	VCTL	I	VCTL signal input terminal.
35	BIN	I	Bch signal input terminal.
36	GIN	I	Gch signal input terminal.

Pin	Name	I/O	Description
37	RIN	I	Rch signal input terminal.
38	BCTL	I	BCTL signal input terminal.
39	FMEM	I	FMEM signal input terminal.
40	N.C.	–	Non Connection.
41	NPB	I	NPB signal input terminal.
42	ADR4	I	Address signal input terminals. (5-Bit)
43	ADR3	I	
44	ADR2	I	
45	ADR1	I	
46	ADR0	I	
47	DB7	I/O	DATA Bus terminals between Microprocessor. (8-Bit)
48	DB6	I/O	
49	DB5	I/O	
50	DB4	I/O	
51	DB3	I/O	
52	DB2	I/O	
53	DB1	I/O	
54	DB0	I/O	
55	CS3	I	Chip Select signal input terminal.
56	CS2	I	Chip Select signal input terminal.
57	CS1	I	Chip Select signal input terminal.
58	NWE	I	Write Enable signal input terminal.
59	BLK	I	Blanking signal input terminal.
60	N.C.	–	Non Connection.
61	BLKZ	O	Blanking signal output terminal.
62	BLKA	O	Blanking signal output terminal.
63	CGD5	I	CGD signal input terminals.
64	CGD4	I	
65	CGD3	I	
66	CGD2	I	
67	CGD1	I	
68	CGD0	I	
69	VDD2	–	Power supply terminal.
70	Vss2	–	Ground terminal.
71	DLS	O	DLS signal terminal.
72	DIN7	I	DIN signal intput terminals. (8-Bit)
73	DIN6	I	
74	DIN5	I	
75	DIN4	I	
76	DIN3	I	
77	DIN2	I	
78	DIN1	I	
79	DIN0	I	
80	N.C.	–	Non Connection.

6.4. IC14 on the Digital Board is using the Character Generator IC M50554254FP.
Description of this IC is as follows:

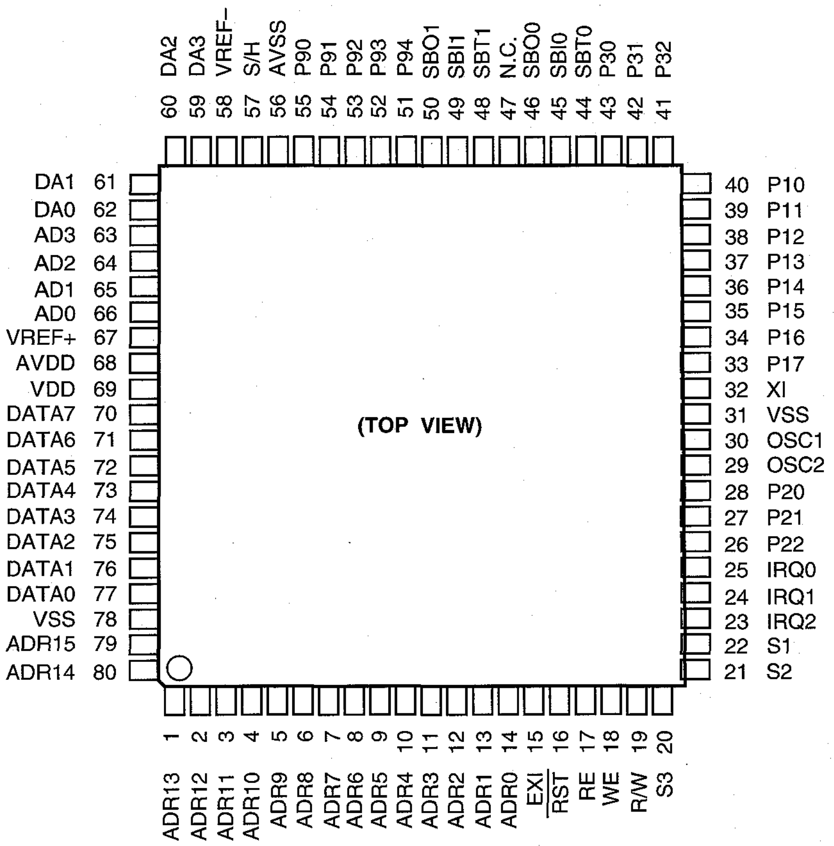

Vss1 1
SCK 2
$\overline{AC}$ 3
OSC1 4
OSC2 5
N/$\overline{P}$ 6
$\overline{CS}$ 7
SIN 8
PAOUT 9
SYEX 10
Vss2 11
CVO 12
CVIN 13
LEBK 14
LECHA 15
CBIN 16
32 Vdd1
31 $\overline{VER}$
30 $\overline{HOR}$
29 OI
28 OO
27 CSYNC
26 R
25 G
24 B
23 CO
22 BLNK
21 YH
20 CB
19 RS
18 Vdd2
17 RSIN

(TOP VIEW)

Pin	Name	I/O	Description
1	Vss1	–	Ground terminal.
2	SCK	I	SCK signal input terminal.
3	$\overline{AC}$	I	$\overline{AC}$ signal input terminal.
4	OSC1	I	OSC1 signal input terminal.
5	OSC2	I	OSC2 signal input terminal.
6	N/$\overline{P}$	I	NTSC/PAL selection signal input terminal. H=NTSC; L=PAL
7	$\overline{CS}$	I	$\overline{CS}$ signal input terminal.
8	SIN	I	Serial Data input terminal.
9	PAOUT	O	PAOUT signal output terminal.
10	SYEX	I	SYEX signal input terminal.
11	Vss2	–	Ground terminal.
12	CVO	O	CVO signal output terminal.
13	CVIN	I	CVIN signal input terminal.
14	LEBK	I	LEBK signal input terminal.
15	LECHA	I	LECHA signal input terminal.
16	CBIN	I	CBIN signal input terminal.
17	RSIN	I	RSIN signal input terminal.
18	Vdd2	–	Power supply terminal.
19	RS	O	RS signal output terminal.
20	CB	O	CB signal output terminal.
21	YH	O	YH signal output terminal.

Pin	Name	I/O	Description
22	BLNK	O	BLNK signal output terminal.
23	CO	O	CO signal output terminal.
24	B	O	B signal output terminal.
25	G	O	G signal output terminal.
26	R	O	R signal output terminal.
27	CSYNC	I	CSYNC signal output terminal.
28	OO	O	OO signal output terminal.
29	OI	I	OI signal input terminal.
30	$\overline{HOR}$	I	$\overline{HOR}$ signal input terminal.
31	$\overline{VER}$	I	$\overline{VER}$ signal input terminal.
32	VDD1	–	Power supply terminal.

6.5. IC10 on the Digital Board is using the 8-bit Microprocessor IC MN188166CUQ2.
Description of this IC is as follows:


DA2 60
DA3 59
VREF– 58
S/H 57
AVSS 56
P90 55
P91 54
P92 53
P93 52
P94 51
SBO1 50
SBI1 49
SBT1 48
N.C. 47
SBO0 46
SBI0 45
SBT0 44
P30 43
P31 42
P32 41
DA1 61
DA0 62
AD3 63
AD2 64
AD1 65
AD0 66
VREF+ 67
AVDD 68
VDD 69
DATA7 70
DATA6 71
DATA5 72
DATA4 73
DATA3 74
DATA2 75
DATA1 76
DATA0 77
VSS 78
ADR15 79
ADR14 80
(TOP VIEW)
40 P10
39 P11
38 P12
37 P13
36 P14
35 P15
34 P16
33 P17
32 XI
31 VSS
30 OSC1
29 OSC2
28 P20
27 P21
26 P22
25 IRQ0
24 IRQ1
23 IRQ2
22 S1
21 S2
1 ADR13
2 ADR12
3 ADR11
4 ADR10
5 ADR9
6 ADR8
7 ADR7
8 ADR6
9 ADR5
10 ADR4
11 ADR3
12 ADR2
13 ADR1
14 ADR0
15 EXI
16 RST
17 RE
18 WE
19 R/W
20 S3

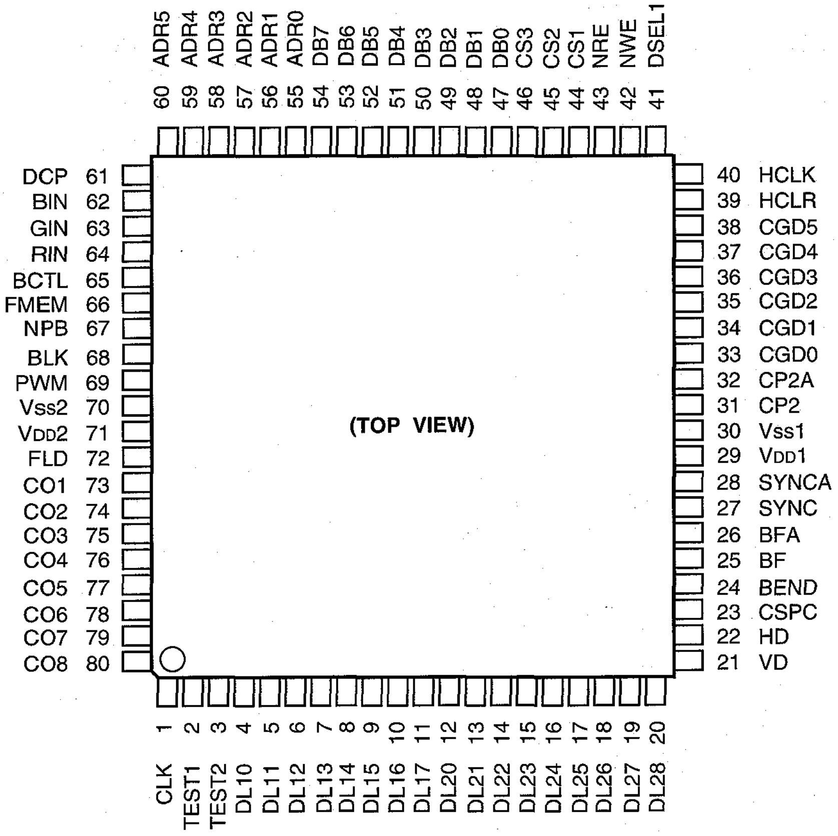
Pin	Name	I/O	Description
1	ADR13	O	Address signal output terminals. (16-Bit)
2	ADR12	O	
3	ADR11	O	
4	ADR10	O	
5	ADR9	O	
6	ADR8	O	
7	ADR7	O	
8	ADR6	O	
9	ADR5	O	
10	ADR4	O	
11	ADR3	O	
12	ADR2	O	
13	ADR1	O	
14	ADR0	O	

Pin	Name	I/O	Description
15	EXI	I/O	EXI signal input/output terminal.
16	$\overline{\text{RST}}$	I	Reset signal input terminal.
17	RE	O	Read Enable signal output terminal.
18	WE	O	Write Enable signal output terminal.
19	R/W	I/O	R/W signal input/output terminal.
20	S3	I/O	S3 signal input/output terminal.
21	S2	I/O	S2 signal input/output terminal.
22	S1	I/O	S1 signal input/output terminal.
23	IRQ2	I	IRQ2 signal input terminal.
24	IRQ1	I	IRQ1 signal input terminal.
25	IRQ0	I	IRQ0 signal input terminal.
26	P22	I	P22 signal input terminal.

Pin	Name	I/O	Description
27	P21	I	P21 signal input terminal.
28	P20	I	P20 signal input terminal.
29	OSC2	O	Crystal Oscillator output terminal.
30	OSC1	I	Crystal Oscillator input terminal.
31	VSS	–	Ground terminal.
32	XI	I	XI signal input/output terminal.
33	P17	O	P17 signal output terminal.
34	P16	O	P16 signal output terminal.
35	P15	O	P15 signal output terminal.
36	P14	O	P14 signal output terminal.
37	P13	O	P13 signal output terminal.
38	P12	O	P12 signal output terminal.
39	P11	O	P11 signal output terminal.
40	P10	O	P10 signal output terminal.
41	P32	O	P32 signal output terminal.
42	P31	O	P31 signal output terminal.
43	P30	O	P30 signal output terminal.
44	SBT0	O	SBT0 signal output terminal.
45	SBI0	I	SBI0 signal input terminal.
46	SBO0	O	SBO0 signal output terminal.
47	N.C.	–	Non connection.
48	SBT1	I	SBT1 signal input terminal.
49	SBI1	I/O	SBI1 signal input/output terminal.
50	SBO1	O	SBO1 signal output terminal.
51	P94	I	P94 signal input terminal.
52	P93	I	P93 signal input terminal.
53	P92	I	P92 signal input terminal.
54	P91	I	P91 signal input terminal.
55	P90	I	P90 signal input terminal.
56	AVSS	–	Ground terminal.
57	S/H	–	S/H terminal.
58	VREF–	I	VREF– voltage input terminal.
59	DA3	O	DA3 signal output terminal.
60	DA2	O	DA2 signal output terminal.
61	DA1	O	DA1 signal output terminal.
62	DA0	O	DA0 signal output terminal.
63	AD3	I	AD3 signal input terminal.
64	AD2	I	AD2 signal input terminal.
65	AD1	I	AD1 signal input terminal.
66	AD0	I	AD0 signal input terminal.
67	VREF+	I	VREF+ voltage input terminal.
68	AVDD	–	Power supply terminal.
69	VDD	–	Power supply terminal.

Pin	Name	I/O	Description
70	DATA7	I/O	Data input/output terminals. (8-Bit)
71	DATA6	I/O	
72	DATA5	I/O	
73	DATA4	I/O	
74	DATA3	I/O	
75	DATA2	I/O	
76	DATA1	I/O	
77	DATA0	I/O	
78	VSS	–	Ground terminal.
79	ADR15	O	Address signal output terminals. (16-Bit)
80	ADR15	O	

6.6. IC9 on the Digital Board is using the Chroma Digital Signal Processor IC MN6731FHP.
Description of this IC is as follows:

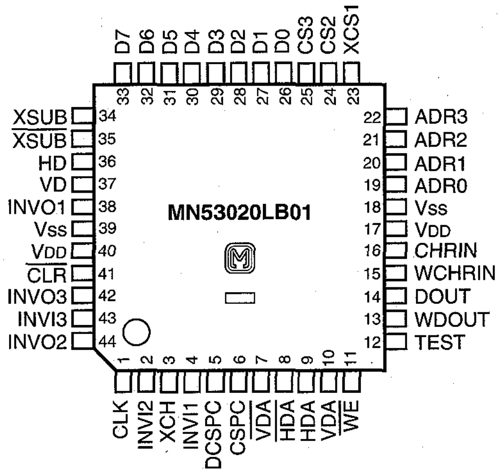

ADR5 60
ADR4 59
ADR3 58
ADR2 57
ADR1 56
ADR0 55
DB7 54
DB6 53
DB5 52
DB4 51
DB3 50
DB2 49
DB1 48
DB0 47
CS3 46
CS2 45
CS1 44
NRE 43
NWE 42
DSEL1 41
DCP 61
BIN 62
GIN 63
RIN 64
BCTL 65
FMEM 66
NPB 67
BLK 68
PWM 69
Vss2 70
VDD2 71
FLD 72
CO1 73
CO2 74
CO3 75
CO4 76
CO5 77
CO6 78
CO7 79
CO8 80
40 HCLK
39 HCLR
38 CGD5
37 CGD4
36 CGD3
35 CGD2
34 CGD1
33 CGD0
32 CP2A
31 CP2
30 Vss1
29 VDD1
28 SYNCA
27 SYNC
26 BFA
25 BF
24 BEND
23 CSPC
22 HD
21 VD
(TOP VIEW)
1 CLK
2 TEST1
3 TEST2
4 DL10
5 DL11
6 DL12
7 DL13
8 DL14
9 DL15
10 DL16
11 DL17
12 DL20
13 DL21
14 DL22
15 DL23
16 DL24
17 DL25
18 DL26
19 DL27
20 DL28

Pin	Name	I/O	Description
1	CLK	I	Clock Pulse input terminal.
2	TEST1	I	Test 1 input terminal.
3	TEST2	I	Test 1 input terminal.
4	DL10	I	DL signal input terminals.
5	DL11	I	
6	DL12	I	
7	DL13	I	
8	DL14	I	
9	DL15	I	
10	DL16	I	
11	DL17	I	
12	DL20	I	
13	DL21	I	
14	DL22	I	
15	DL23	I	
16	DL24	I	
17	DL25	I	
18	DL26	I	

Pin	Name	I/O	Description
19	DL27	I	DL Signal input terminals.
20	DL28	I	
21	VD	I	VD signal input terminal.
22	HD	I	HD signal input terminal.
23	CSPC	I	CSPC signal input terminal.
24	BEND	O	Border End signal output terminal.
25	BF	I	BF signal input terminal.
26	BFA	I	BFA signal input terminal.
27	SYNC	I	Sync signal input terminal.
28	SYNCA	O	Sync signal output terminal.
29	VDD1	–	Power supply terminal.
30	Vss1	–	Ground terminal.
31	CP2	I	Clamp Pulse input terminal.
32	CP2A	O	Clamp Pulse output terminal.
33	CGD0	I	CGD Signal input terminals.
34	CGD1	I	
35	CGD2	I	
36	CGD3	I	

Pin	Name	I/O	Description
37	CGD4	I	CGD signal input terminals.
38	CGD5	I	
39	HCLR	I	HCLR signal input terminal.
40	HCLK	O	HCLK signal output terminal.
41	DSEL1	I	DSEL1 signal input terminal.
42	NWE	I	Write Enable signal input terminal.
43	NRE	I	Read Enable signal input terminal.
44	CS1	I	Chip Select signal input terminal.
45	CS2	I	Chip Select signal input terminal.
46	CS3	I	Chip Select signal input terminal.
47	DB0	I/O	DATA Bus terminals between Microprocessor. (8-Bit)
48	DB1	I/O	
49	DB2	I/O	
50	DB3	I/O	
51	DB4	I/O	
52	DB5	I/O	
53	DB6	I/O	
54	DB7	I/O	
55	ADR0	I	Address signal input terminals. (5-Bit)
56	ADR1	I	
57	ADR2	I	
58	ADR3	I	
59	ADR4	I	
60	ADR5	I	
61	DCP	I	DCP signal input terminal.
62	BIN	I	B signal input terminal.
63	GIN	I	G signal input terminal.
64	RIN	I	R signal input terminal.
65	BCTL	I	BCTL signal input terminal.
66	FMEM	I	FMEM signal input terminal.
67	NPB	I	NPB signal input terminal.
68	BLK	I	Blanking signal input terminal.
69	PWM	O	PWM signal output terminal.
70	Vss2	–	Ground terminal.
71	VDD2	–	Power supply terminal.
72	FLD	O	FLD signal output terminal.
73	CO1	O	Chroma signal output terminals. (8-Bit)
74	CO2	O	
75	CO3	O	
76	CO4	O	
77	CO5	O	
78	CO6	O	
79	CO7	O	
80	CO8	O	

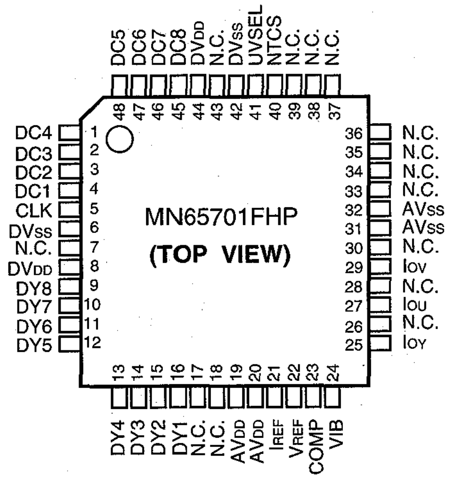
6.7. IC13 on the Digital Board is using the ELC Signal Generator IC MN53020LB01.
Description of this IC is as follows:

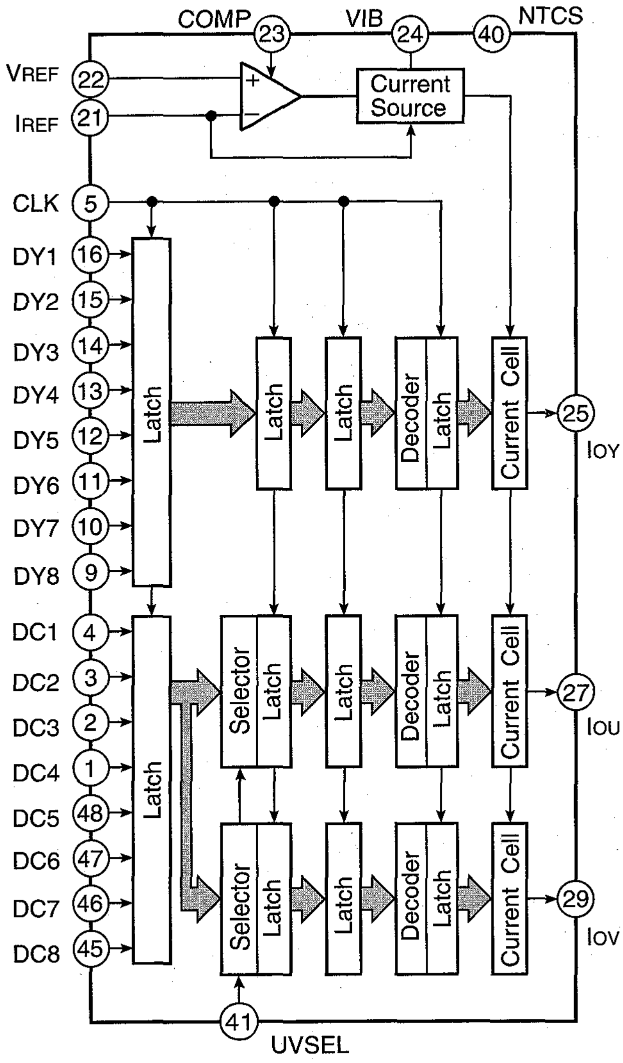

MN53020LB01
D7 D6 D5 D4 D3 D2 D1 D0 CS3 CS2 XCS1
33 32 31 30 29 28 27 26 25 24 23
XSUB 34
$\overline{XSUB}$ 35
HD 36
VD 37
INVO1 38
Vss 39
VDD 40
$\overline{CLR}$ 41
INVO3 42
INVI3 43
INVO2 44
22 ADR3
21 ADR2
20 ADR1
19 ADR0
18 Vss
17 VDD
16 CHRIN
15 WCHRIN
14 DOUT
13 WDOUT
12 TEST
1 2 3 4 5 6 7 8 9 10 11
CLK INVI2 XCH INVI1 DCSPC CSPC $\overline{VDA}$ $\overline{HDA}$ HDA VDA $\overline{WE}$

(TOP VIEW)

Pin	Name	I/O	Description
1	CLK	I	Clock Pulse input terminal.
2	INVI2	I	INVI2 signal input terminal.
3	XCH	I	Clock Oscillator output terminal.
4	INVI1	I	INVI1 signal input terminal.
5	DCSPC	O	DCPSC signal output terminal.
6	CSPC	I	CSPC signal output terminal.
7	$\overline{\text{VDA}}$	O	$\overline{\text{VDA}}$ signal output terminal.
8	$\overline{\text{HDA}}$	O	$\overline{\text{HDA}}$ signal output terminal.
9	HDA	I	HDA signal input terminal.
10	VDA	I	VDA signal input terminal.
11	$\overline{\text{WE}}$	I	Write Enable signal input terminal.
12	TEST	–	Test terminal.
13	WDOUT	O	WD signal output terminal.
14	DOUT	O	Data output terminal.
15	WCHRIN	I	Wide Character signal input terminal.
16	CHRIN	I	Character signal input terminal.
17	VDD	–	Power supply terminal.
18	Vss	–	Ground terminal.
19	ADR0	I	Address signal input terminals. (4-Bit)
20	ADR1	I	
21	ADR2	I	
22	ADR3	I	
23	XCS1	I	Chip Select signal input terminal.
24	CS2	I	Chip Select signal input terminal.
25	CS3	I	Chip Select signal input terminal.
26	D0	I	Data input terminals. (8-Bit)
27	D1	I	
28	D2	I	
29	D3	I	
30	D4	I	
31	D5	I	Data input terminals. (8-Bit)
32	D6	I	
33	D7	I	
34	XSUB	O	XSUB signal output terminal.
35	$\overline{\text{XSUB}}$	O	$\overline{\text{XSUB}}$ signal output terminal.
36	HD	I	HD signal input terminal.
37	VD	I	VD signal input terminal.
38	INVO1	O	INVO1 signal output terminal.
39	Vss	–	Ground terminal.
40	VDD	–	Power supply terminal.
41	$\overline{\text{CLR}}$	I	$\overline{\text{CLR}}$ signal input terminal.
42	INVO3	O	INVO3 signal output terminal.
43	INVI3	I	INVI3 input terminal.
44	INVO2	O	INVO2 signal output terminal.

6.8. IC12 on the Digital Board is using the 8-bit 3-ch D/A Converter IC MN65701FHP.
Description of this IC is as follows:


DC5
DC6
DC7
DC8
DVDD
N.C.
DVss
UVSEL
NTCS
N.C.
N.C.
N.C.
48 47 46 45 44 43 42 41 40 39 38 37
DC4 1
DC3 2
DC2 3
DC1 4
CLK 5
DVss 6
N.C. 7
DVDD 8
DY8 9
DY7 10
DY6 11
DY5 12
36 N.C.
35 N.C.
34 N.C.
33 N.C.
32 AVss
31 AVss
30 N.C.
29 IOV
28 N.C.
27 IOU
26 N.C.
25 IOY
MN65701FHP
(TOP VIEW)
13 14 15 16 17 18 19 20 21 22 23 24
DY4
DY3
DY2
DY1
N.C.
N.C.
AVDD
AVDD
IREF
VREF
COMP
VIB


COMP 23
VIB 24
40 NTCS
VREF 22
IREF 21
+
−
Current Source
CLK 5
DY1 16
DY2 15
DY3 14
DY4 13
DY5 12
DY6 11
DY7 10
DY8 9
DC1 4
DC2 3
DC3 2
DC4 1
DC5 48
DC6 47
DC7 46
DC8 45
Latch
Latch
Latch
Latch
Decoder
Latch
Current Cell
25 IOY
Selector
Latch
Latch
Decoder
Latch
Current Cell
27 IOU
Selector
Latch
Latch
Decoder
Latch
Current Cell
29 IOV
41 UVSEL

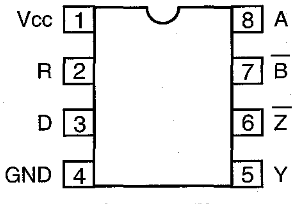
Pin	Name	I/O	Description
1	DC4	I	Chroma Digital Data (5th.) input terminal.
2	DC3	I	Chroma Digital Data (6th.) input terminal.
3	DC2	I	Chroma Digital Data (7th.) input terminal.
4	DC1	I	Chroma Digital Data (MSB) input terminal.
5	*CLK*	*I*	*Clock input terminal.*
6	DVss	–	Ground terminal for Digital Circuit.
7	N.C.	–	Non Connection.
8	DVDD	–	+5V supply terminal for Digital Circuit.
9	DY8	I	Luminance Digital Data (LSB) input terminal.
10	DY7	I	Luminance Digital Data (2nd.) input terminal.
11	DY6	I	Luminance Digital Data (3rd.) input terminal.
12	DY5	I	Luminance Digital Data (4th.) input terminal.
13	DY4	I	Luminance Digital Data (5th.) input terminal.
14	DY3	I	Luminance Digital Data (6th.) input terminal.
15	DY2	I	Luminance Digital Data (7th.) input terminal.
16	DY1	I	Luminance Digital Data (MSB) input terminal.
17	N.C.	–	Non Connection.
18	N.C.	–	Non Connection.
19	AVDD	–	+5V supply terminal for Analog Circuit.
20	AVDD	–	+5V supply terminal for Analog Circuit.
21	IREF	I	Full scale adjuting resistor connecting terminal.
22	VREF	I	Reference Voltage supply terminal.
23	COMP	I	Phase compensation input terminal.
24	VIB	I	Capacitor connecting terminal.

Pin	Name	I/O	Description
25	IOY	O	R signal analog current signal output terminal.
26	N.C.	–	Non Connection.
27	IOU	O	G signal analog current output terminal.
28	N.C.	–	Non Connection.
29	IOV	O	B signal analog current output terminal.
30	N.C.	–	Non Connection.
31	AVss	–	Ground terminal for Analog Circuit.
32	AVss	–	Ground terminal for Analog Converter Circuit.
33	N.C.	–	Non Connection.
34	N.C.	–	Non Connection.
35	N.C.	–	Non Connection.
36	N.C.	–	Non Connection.
37	N.C.	–	Non Connection.
38	N.C.	–	Non Connection.
39	N.C.	–	Non Connection.
40	NTCS	I	Chroma signal 2's Complement /Binary Selectimg signal input terminal. L = 2's Complement input H = Binary input
41	UVSEL	I	Chroma U and Chroma V Selecting signal input terminal. L = U signal H = V signal
42	DVss	–	Ground terminal for Digital Circuit.
43	N.C.	–	Non Connection.
44	VVDD	–	+5V supply terminal for Digital Circuit.
45	DC8	I	Chroma Digital Data (LSB) input terminal.
46	DC7	I	Chroma Digital Data (2nd.) input terminal.
47	DC6	I	Chroma Digital Data (3rd.) input terminal.
48	DC5	I	Chroma Digital Data (4th.) input terminal.

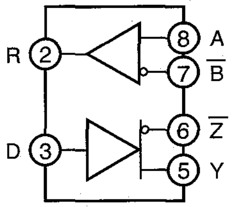
7. Power Supply Board

7.1. IC1 on the Power Supply Board is using the RS-485 Transceiver IC YWM75179P.

Description of this IC is as follows:



(TOP VIEW)



Truth Table

Driver Section

INPUT	OUTPUTS	
D	Y	$\overline{Z}$
H	H	L
L	L	H

Receiver Section

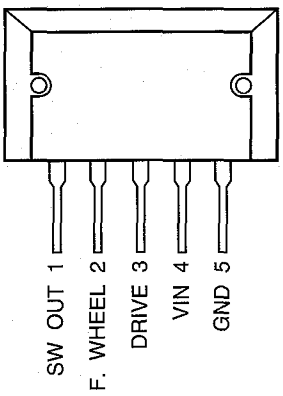
INPUT	OUTPUT
VIO	R
VIO>0.2V	H
-0.2V<VIO<0.2V	*
VIO>-0.2V	L

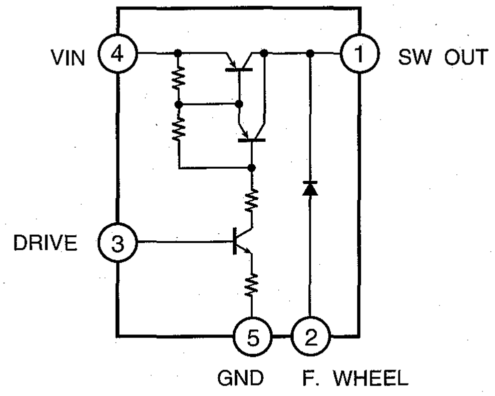
VIO : (A Voltage) - ($\overline{B}$ Voltage)
* : Indeterminacy

8. +12V REG Board

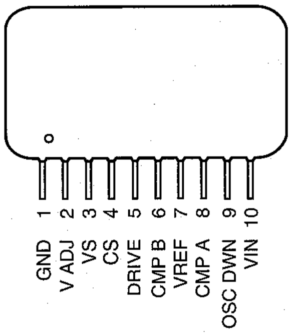
8.1 IC1 on the +12V REG Board is using the Switching Regurator IC YWSTR7002.

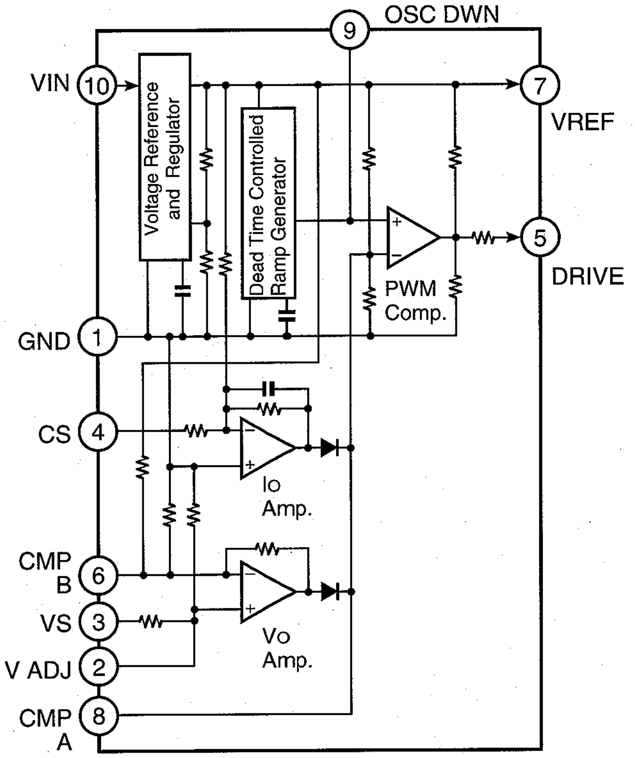
Description of this IC is as follows:





8.2. IC2 on the +12V REG Board is using the Switching Regurator Controller IC YWSI8021.
Description of this IC is as follows:

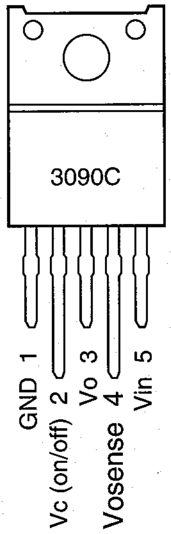

1 GND
2 V ADJ
3 VS
4 CS
5 DRIVE
6 CMP B
7 VREF
8 CMP A
9 OSC DWN
10 VIN

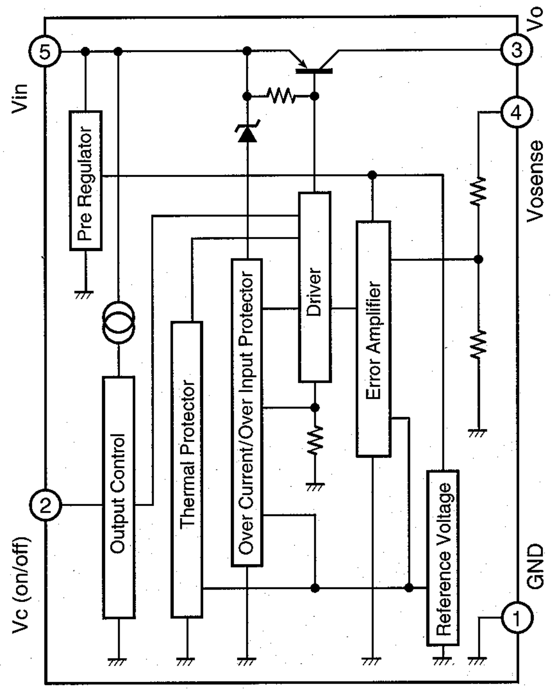

OSC DWN
9
VIN 10
7
VREF
Voltage Reference and Regulator
Dead Time Controlled Ramp Generator
5
DRIVE
PWM Comp.
GND 1
CS 4
Io Amp.
CMP B 6
VS 3
V ADJ 2
Vo Amp.
CMP A 8

Pin	Name	I/O	Description
1	GND	–	Ground terminal.
2	V ADJ	I	Output voltage adjusting terminal.
3	VS	I	Voltage Sense terminal.
4	CS	I	Current Sense terminal.
5	DRIVE	O	Drive signal output terminal.
6	CMP A	–	Compensation A terminal.
7	VREF	O	Reference voltage output terminal.
8	CMP B	–	Compensation B terminal.
9	OSC DWN	O	Oscillation Out Shut Down signal output terminal.
10	VIN	I	Input voltage supply terminal.

9. +10V/+5V REG Board

9.1. IC3 on the +10V/+5V REG Board is using the Regurator IC YWSI3090C.
Description of this IC is as follows:


3090C
GND 1
Vc (on/off) 2
Vo 3
Vosense 4
Vin 5

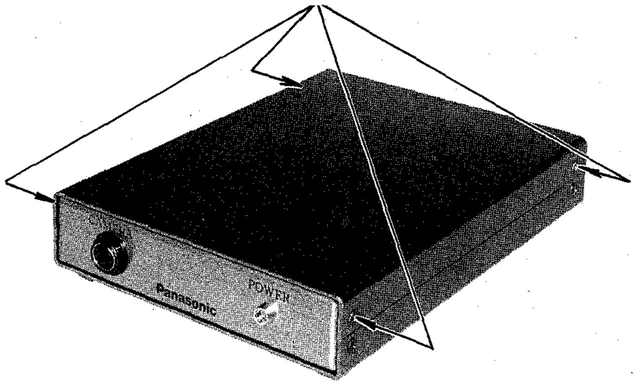

5
Vin
3
Vo
4
Vosense
Pre Regulator
Driver
Error Amplifier
Output Control
Thermal Protector
Over Current/Over Input Protector
Reference Voltage
2
Vc (on/off)
1
GND

Modification Procedure for E.V.R. Adjustment Kit

- **Before start to adjust the WV-CS500, your E.V.R. Adjustment Kit have to be modified for up-to-date version.**

- The modification procedure is as follows:

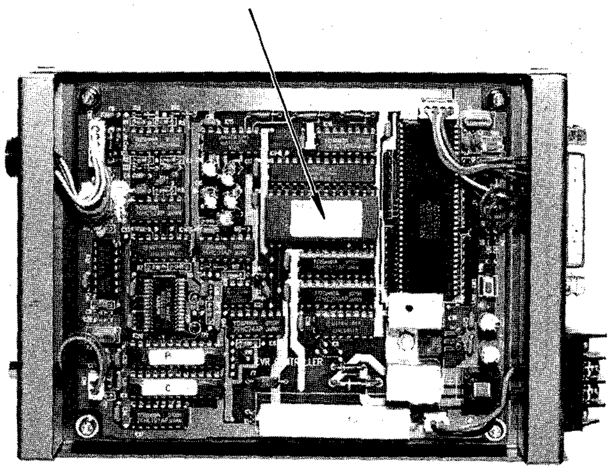
- Referring to Fig. 1, remove four screws fixing the Upper Cover of the E.V.R. Adjustment Kit.



Remove four screws.

Fig. 1

- Referring to Fig. 2, remove IC5 (ROM IC) on the Main Board of the E.V.R. Adjustment Kit.



Remove IC5 ROM IC.

Fig. 2

- Insert the new ROM IC with IC Socket to the Main Board of the E.V.R. Adjustment Kit.

- Mount the Upper Cover of the E.V.R. Adjustment Kit.

- The part number of new ROM IC with IC Socket for E.V.R. Adjustment Kit is YWV0EA0274AN.

About Your Computer

In order to run the E.V.R. (Electric Variable Resistor) adjustment program your IBM-PC/AT Type or compatible must meet the following requirements:

- The DOS Operating System must be 3.3 or higher.
- The Operating System must be 100% compatible with your computer.
- The memory in your IBM-PC must be at least 640K-bytes, and 512K-bytes shall be available to the E.V.R. adjustment program.

Installing E.V.R. Adjustment Program

- The Example given here is for A 2 drive computer, your procedure might vary slightly depending on drive configuration.
- Formatting new disk and making a copy of DOS Operating System.

  a) Insert disk containing DOS operating system into your floppy drive (for example, drive A) and type **A:**
  b) Insert new disk into your floppy drive (for example, drive B).
  c) Format and make a copy of DOS operating system from your original disk to new disk by typing **FORMAT B: / S** and press the **ENTER** key.
  d) Type **COPY ANSI. SYS B:** and press the **ENTER** key.

- Install E.V.R. Adjustment Program onto formatted new disk with DOS operating system.

  e) Take out original disk containing DOS operating system from your floppy drive (drive A) and insert disk containing E.V.R. adjustment program into your floppy drive (drive A) and type **A:**
  f) At the prompt, type **CD IBMPC** and press the **ENTER** key.
  g) If required, type **COPY CONFIG. SYS B**: and press the **ENTER** key.
  h) Type **CD NTSC** for NTSC.
  i) Type **COPY ADJ2. EXE B:** and press the **ENTER** key.
  j) Type **CD ** and press the **ENTER** key.
  k) Type **CD SEQ** and press the **ENTER** key.
  l) Type **COPY CS500E. SEQ B:** and press the **ENTER** key.
  m) Type **CD ** and press the **ENTER** key.
  n) Type **CD EVR** and press the **ENTER** key.
  o) Type **COPY CS500E. EVR B:** and press the **ENTER** key.
  p) After completing installation of program, you are ready to use the E.V.R. adjustment program.

Note:

When completed the new disk should be a bootable disk which contains the following files:

1.	COMMAND	COM
2.	ANSI	SYS
3.	CONFIG	SYS
4.	ADJ2P	EXE
5.	CS500E	SEQ
6.	CS500E	EVR

ADJUSTMENT PROCEDURE

1. Test Equipment Required

- The following test Equipments are required for adjustment of the Combination Camera System WV-CS500.
- Oscilloscope
- Frequency Counter
- Digital Voltmeter
- Vectorscope
- Waveform Monitor
- Underscanned Colour Video Monitor
- 12 V DC Power Supply Unit
- Lux Meter
- Lighting (275 footcandles (2,750 lux), Colour Temperature 3,200K)
- Personal Computer (IBM PC/AT type or equivalent)
- System Controller (WV-CU300)
- Multiplex Unit (WJ-MP404)
- Standard Straight RS-232C Cable
- White Chart or White Paper
- Resolution Test Chart
- Colour Temperature Conversion Filters as shown in the Table 1-1.

	Part No.	Description
KODAK	80B	More than 3x3 cm (1 sheet)
FUJI	LBB-12	More than 3x3 cm (1 sheet)
KENKO	C12	More than 20mmø (1 Piece)
HOYA	LB-120	More than 20mmø (1 Piece)
NICON	B12	More than 20mmø (1 Piece)

Table 1-1

- Logarithmic Gray Scale Chart (Part Number: YWV2310RB99) as shown Fig. 1-1.

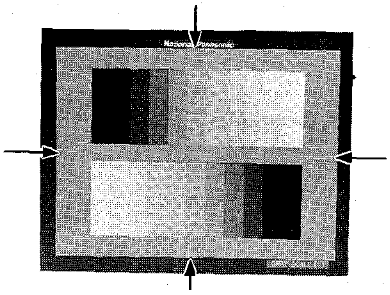


Fig. 1-1

- Colour Chip Chart (Part Number: YWV2100RB98) as shown in Fig. 1-2.

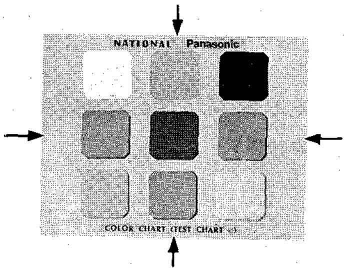


Fig. 1-2

- Extension Board (Part Number : YWVKZCL32P1A) as shown in Fig. 1-3.

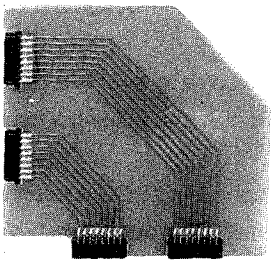


Fig. 1-3

- Electric Variable Resistor (E.V.R.) kit (Part No.: YWV0EA0182AN) as shown in Fig. 1-4.

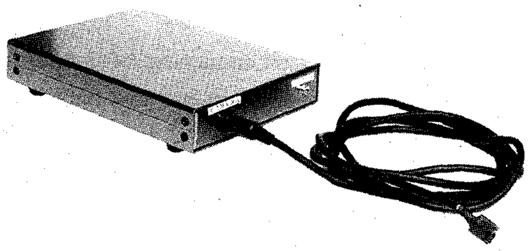


Fig. 1-4

2. Disassembling Procedure for Adjustment

2.1. Camera Unit

- Referring to Fig. 2-1, remove the Camera Front Cover from the Camera, remove six screws fixing the Camera Side Covers and remove the Camera Side Covers.

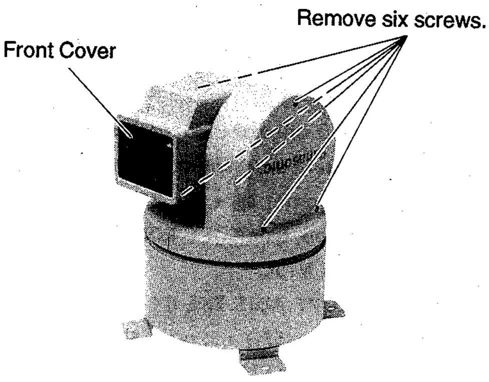

Remove six screws.
Front Cover

Fig. 2-1

- Referring to Fig. 2-2, remove three screws fixing the Camera Unit and remove the Camera Unit.

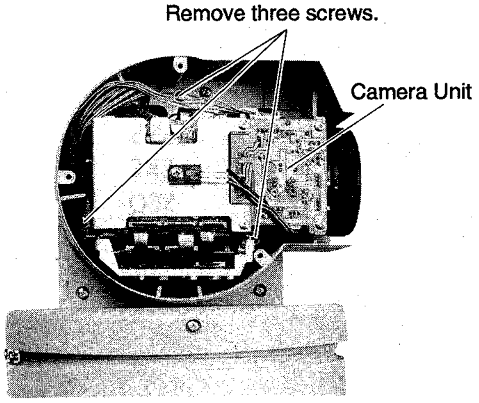

Remove three screws.
Camera Unit

Fig. 2-2

- Referring to Fig. 2-3, remove one screw fixing the Sync/Encoder Board Holding Angle and remove the Holding Angle.

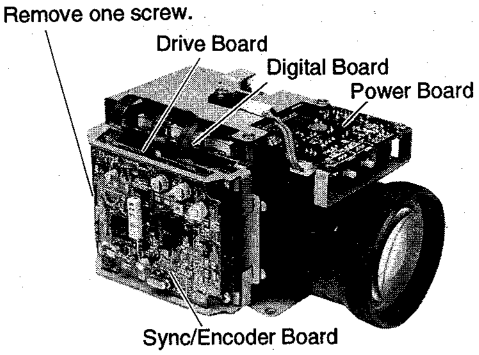

Remove one screw.
Drive Board
Digital Board
Power Board
Sync/Encoder Board

Fig. 2-3

- When adjusting the Camera use an Extension Board as shown in Fig. 2-4.

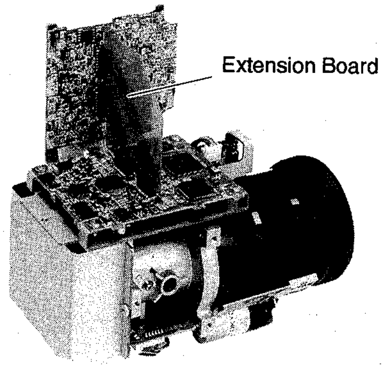

Extension Board

Fig. 2-4

2.1. Pan-Tilt Unit

- Referring to Fig. 2-5, remove four screws fixing the Camera Cover and remove the Camera Cover.
- Referring to Fig. 2-5, remove three screws fixing the Pan-Tilt Cover and remove the Pan-Tilt Cover.

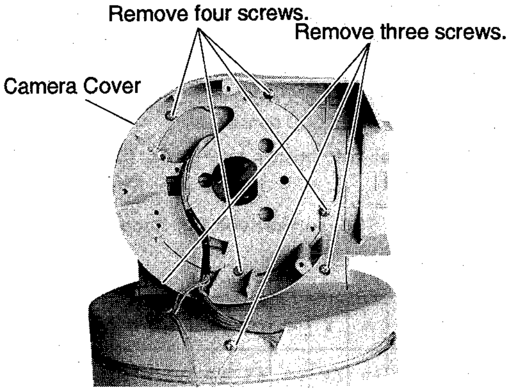

Remove four screws.
Remove three screws.
Camera Cover

Fig. 2-5

- Referring to Fig. 2-6, remove four screws fixing the Bottom Cover and remove the Bottom Cover.

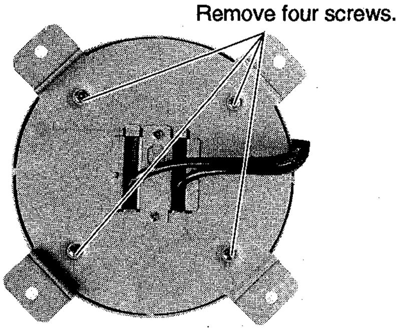

Remove four screws.

Fig. 2-6

- Referring to Fig. 2-7, remove three screws fixing the Pan-Tilt Unit and take out the Pan-Tilt Unit from the Pan-Tilt Case.

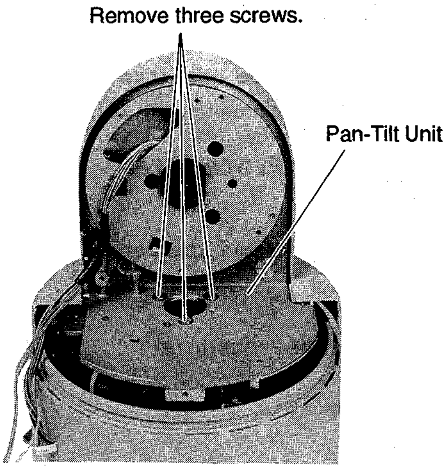

Remove three screws.
Pan-Tilt Unit

Fig. 2-7

3. Connection and Setting Up for Adjustment

3.1. Connection

- The Fig. 3-1 shows the connection diagram for the adjustment procedure.

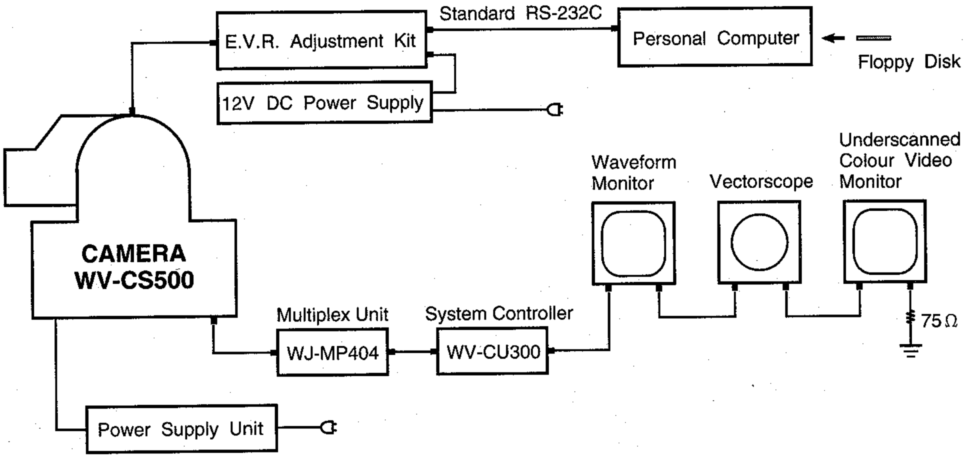

E.V.R. Adjustment Kit
Standard RS-232C
Personal Computer
Floppy Disk
12V DC Power Supply
CAMERA
WV-CS500
Waveform Monitor
Vectorscope
Underscanned Colour Video Monitor
75 Ω
Multiplex Unit
WJ-MP404
System Controller
WV-CU300
Power Supply Unit

Fig. 3-1

- Connect the Video Output Connector of the WV-CS500 to the Camera Input Connector of the System Controller using the coaxial cable.
- Connect the Underscanned Colour Video Monitor to the Video Output Connector on the Multiplex Unit WJ-MP404 and the System Controller WV-CU300 through the Waveform Monitor and the Vectorscope using the coaxial cables.
- Terminate the input terminal of the Underscanned Color Video Monitor with 75 Ω.
- Connect the Power Supply Unit to the WV-CS500.
- Connect the prove of the Digital Voltmeter, Oscilloscope or Frequency Counter at the desired Test Point in each adjustment step.

3.2. Setting Up for Standard Picture

- The adjustment should be done after 10 minutes warm-up.
- Set the Logarithmic Gray Scale Chart.
- Incident light of 2,750 ± 50 lux on the Logarithmic gray Scale Chart.
- Aim the Camera at the Logarithmic Gray Scale Chart.
- Set the Camera so that the Logarithmic Gray Scale Chart becomes full picture on the Underscanned Color Video Monitor by the System Controller.
- Connect the Oscilloscope to pin 1 (CDS OUT) of CN5 on the Digital Board.
- Adjust the Lens Focus to obtain correct focal point by the System Controller.
- The adjustments should be done with this Standard Picture, unless otherwise specified.

4. Adjustment Procedure

- Refer to the Location of the Test Points and Adjusting Controls on the page 25.

■ Adjustment Procedure-1

(1) +10V Adjustment

Test Point:	**TP1 (+10V)**	**Power Supply Board**
Adjust:	**VR1 (+10V)**	**+10V/+5V REG Board**

- Connect the Digital Voltmeter to TP1.
- Adjust VR1 to obtain 10 ± 0.05 V DC.

(2) Line-Lock Phase Adjustment

Test Point:	**TP3 (LL)**	**Receiver Board**
	AC Power Line	
Adjust:	**VR2 (LINE PHASE)**	**Receiver Board**

- Set the Line-Lock Switch on the LED/Switch Board to the LL position.
- Connect the CH1 of the Oscilloscope to TP3.
- Connect the CH2 of the Oscilloscope to the AC Power Line.
- Trigger the Oscilloscope at the V-rate.
- Adjust VR2 so that the decay point of the V Sync signal delays 2H ± 1H from the Zero-Cross Point of the AC Power source as shown in Fig. 4-1.
- After finish this adjustment, set the Line-Lock Switch on the LED/Switch Board to the INT position.

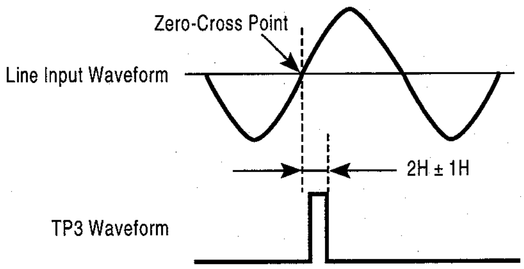


Fig. 4-1

(3) VSUB Adjustment

Test Point:	**Pin 4 of CN1 (VSUB)**	**Sensor Board**
Adjust:	**VR2 (VSUB)**	**Sensor Board**

- Check the Rank letter on the CCD Sensor Ass'y as shown in Fig. 4-2.

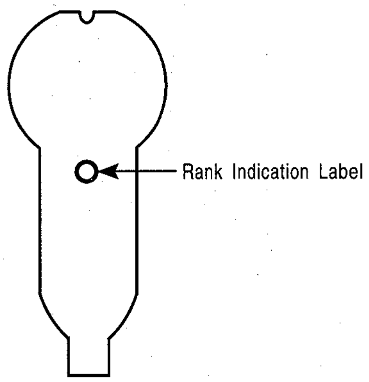


Fig. 4-2

- Connect the Digital Voltmeter to the Pin 4 of CN1.
- Adjust VR2 so that the voltage becomes as shown in Table 4-1.

Rank	A	B	C	D	E	F	G	H	J	K
Voltage	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5
Rank	L	M	N	P	Q	R	S	T	U	–
Voltage	12.0	12.5	13.0	13.5	14.0	14.5	15.0	15.5	16.0	–

Table 4-1

(4) Drive VCO Adjustment

Test Point:	**TP1 (VCO-1)**	**Drive Board**
Adjust:	**L12 (VCO-1)**	**Drive Board**

- Connect the Digital Voltmeter to TP1.
- Adjust L12 to obtain 2.3 ± 0.1 V DC.

(5) Sync Lock VCO Adjustment

Test Point:	**TP3 (EXT VCO)**	**Sync Board**
Adjust:	**L5 (SYNC)**	**Sync Board**

- Supply VD2 signal from the WJ-MP404 to the Camera.
- Connect the Digital Voltmeter to TP3.
- Adjust L5 to obtain 2.3 ± 0.1 V DC.

(6) Back Focus Adjustment

Test Point: Video Output Connector

Adjust: Back Focus Adjustment Screw

- Remove the Insulator Washer as shown in Fig. 4-3.
- Set the Lens Iris to open position by the System Controller.
- Aim the Camera at the Resolution Test Chart further than 10 meters.
- Zoom in and adjust the Focus by the System Controller.
- Zoom out the Lens by the System Controller.
- Slightly loosen the Back Focus Adjusting Screw as shown in Fig. 4-3.
- Adjust Back Focus Adjusting Screw by the flat head screwdriver for best focal point as shown in Fig. 4-3.
- Repeat above procedure until the focus tracks throughout the Lens.
- Tighten the Back Focus Adjusting Screw as shown in Fig. 4-3.

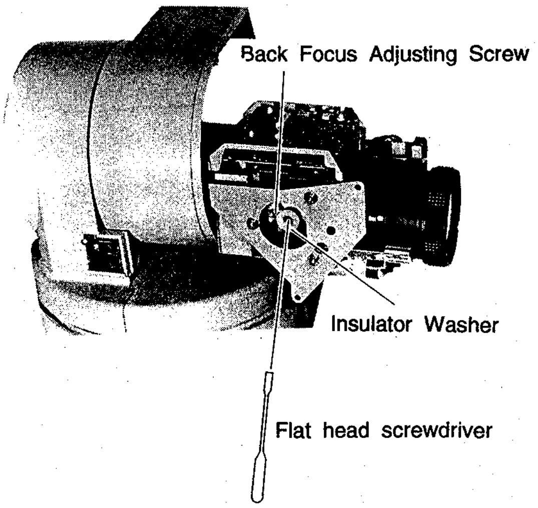


Fig. 4-3

■ Adjustment Procedure-2 (E.V.R.) Adjustment

- Connect the E.V.R. Adjustment Kit to CN6 on the Digital Board using extension cables supplied.
- Connect the E.V.R. Adjustment Kit to IBM PC/AT type using the Standard Straight RS-232C cable.
- Insert new disk containing DOS Operating System and the E.V.R. Adjustment program into IBM PC/AT and turns on the Power Switch of IBM PC/AT.
- At the prompt, type **ADJ2E CS500E** and press the **ENTER** key following initial menu will be displayed in Table 4-2.

```
PANASONIC CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
************************* M E N U ********************* P A L
 1. SC Frequency                        10.1. Carrier Rch
 2.(A). Low Clip                        10.2. Carrier Bch
 2.(B). OB                              10.3. Carrier Rch
 3.(A).1. AGC Off Gain for ALC 1        10.4. Carrier Bch
 3.(A).2. AGC Off Gain for ALC 2        11.(A).1. WB MANU Offset R
 3.(A).3. AGC Off Gain for ALC 3        11.(A).2. WB MANU Offset B
 3.(B). ALC DC                          11.(B).1. WB ATW Offset R
 3.(C). Terget2_IRIS for ALC            11.(B).2. WB ATW Offset B
 3.(D). Terget1_IRIS for ALC&BLC        11.(C).1. WB ATW Limit R
 3.(E). Terget1_ELC for BLC             11.(C).2. WB ATW Limit B
 3.(F). AGC Off Gain for ELC            12.(A).1. 3200K R_Gain
 3.(G). Terget2_ELC for ELC&BLC         12.(A).2. 3200K B_Gain
 4. Pedestal                            12.(A).3. 3200K Phase
 5.(A). Y Level   Low  Byte             12.(B).1. 5100K R_Gain
 6. Knee   Low  Byte                    12.(B).2. 5100K B_Gain
 7. AGC On (Max  Gain)                  13. Highlight Chroma Clip
 8. Burst Phase
 9. Burst Level


<CONTENTS>    TP7 (SC) [SYNC]      4433618+-10Hz
<INSTRUCTION> PLEASE CHOOSE MENU DATA BY ARROW-DATA
  LOAD(F1)      QUIT(F3)       SAVE(F5)
```

Table 4-2

- Press the **SAVE (F5)** key of the Computer, then the Computer will ask you for the file name.
- Give appropriate file name to the Computer. But do not use **CS500E.EVR** for your file.
- This saving procedure is recommended to keep the current adjustment status of the Camera.
- Press the **LOAD (F1)** key and type **CS500E.EVR** and press the **ENTER** key for presetting adjustment of the Camera.
- Press the **ENTER** key to start of adjustment.

Notes:

- **EEPROM** mentioned in this adjustment procedure is IC7 on the Digital Board.
- **RAM** mentioned in this adjustment procedure is IC10 on the Digital Board.
- **C.DSP** mentioned in this adjustment procedure is IC9 on the Digital Board.

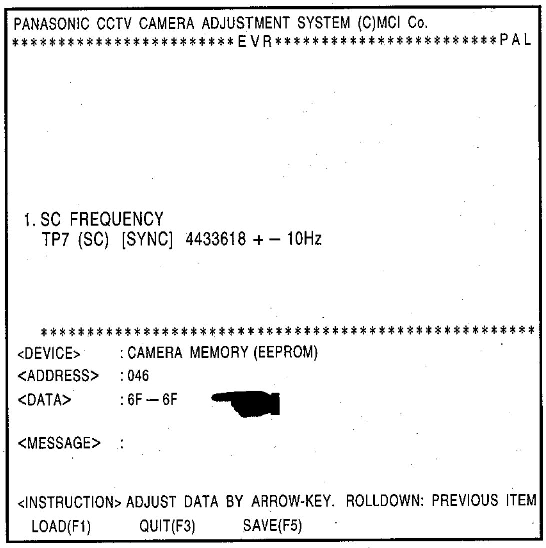
■ Before start to adjustment, set the SW50 (EVR/RC Switch) on the Power Board to EVR Position.

(1). SUBCARRIER FREQUENCY Adjustment

Test Point: **TP7 (SC)** **Sync Board**

Adjust: **EEPROM (046)** **Digital Board**

- The menu as shown in Table 4-3 will be displayed.



```
PANASONIC CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
************************EVR************************PAL




 1. SC FREQUENCY
   TP7 (SC)  [SYNC]  4433618 + - 10Hz



   ****************************************************
<DEVICE>      : CAMERA MEMORY (EEPROM)
<ADDRESS>     : 046
<DATA>        : 6F - 6F

<MESSAGE>     :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY.  ROLLDOWN: PREVIOUS ITEM
  LOAD(F1)        QUIT(F3)        SAVE(F5)
```

Table 4-3

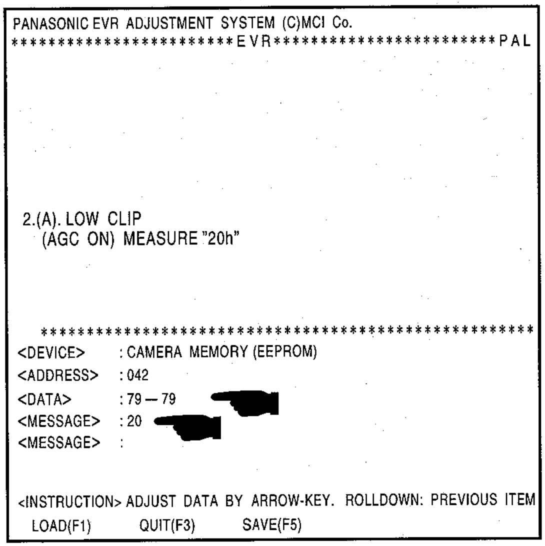
- Connect the Frequency Counter to TP7.
- Adjust data with the **ARROW** keys so that the Subcarrier Frequency becomes 4.433618 MHz ± 10 Hz.
- Press the **ENTER** key for next adjustment.

(2).A. LOW CLIP Adjustment

Test Point: **RAM (0D2)** **Digital Board**

Adjust: **EEPROM (042)** **Digital Board**

- The menu as shown in Table 4-4 will be displayed.



```
PANASONIC EVR ADJUSTMENT SYSTEM (C)MCI Co.
************************EVR************************PAL




 2.(A). LOW CLIP
   (AGC ON) MEASURE "20h"



   ****************************************************
<DEVICE>      : CAMERA MEMORY (EEPROM)
<ADDRESS>     : 042
<DATA>        : 79 - 79
<MESSAGE>     : 20
<MESSAGE>     :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY.  ROLLDOWN: PREVIOUS ITEM
  LOAD(F1)        QUIT(F3)        SAVE(F5)
```

Table 4-4

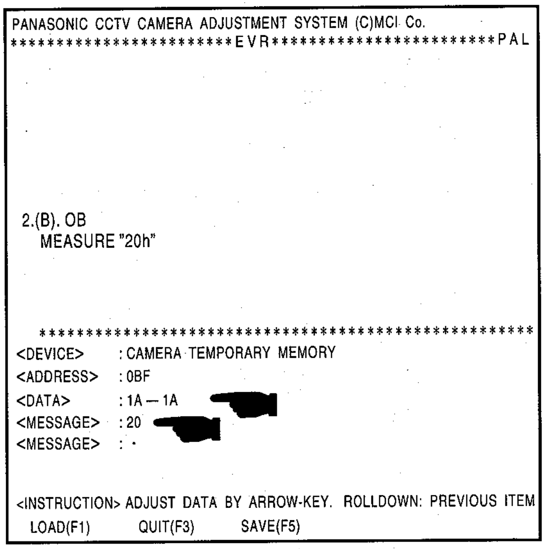
- Cap on the Lens.
- Adjust data with the **ARROW** keys so that the measure data becomes 20.
- Press the **ENTER** key for next adjustment.

(2).B. OB Adjustment

Test Point: **RAM (0D2)** **Digital Board**

Adjust: **RAM (0BF)** **Digital Board**

- The menu as shown in Table 4-5 will be displayed.



```
PANASONIC CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
************************EVR************************PAL




 2.(B). OB
   MEASURE "20h"



   ****************************************************
<DEVICE>      : CAMERA TEMPORARY MEMORY
<ADDRESS>     : 0BF
<DATA>        : 1A - 1A
<MESSAGE>     : 20
<MESSAGE>     :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY.  ROLLDOWN: PREVIOUS ITEM
  LOAD(F1)        QUIT(F3)        SAVE(F5)
```

Table 4-5

- Cap on the Lens.
- Adjust data with the **ARROW** keys so that the measure data becomes 20.
- Press the **PG DN** key once to return to (2).A, and repeat adjustment steps (2).A. and (2).B. until both data become 20.
- Press the **ENTER** key for next adjustment.

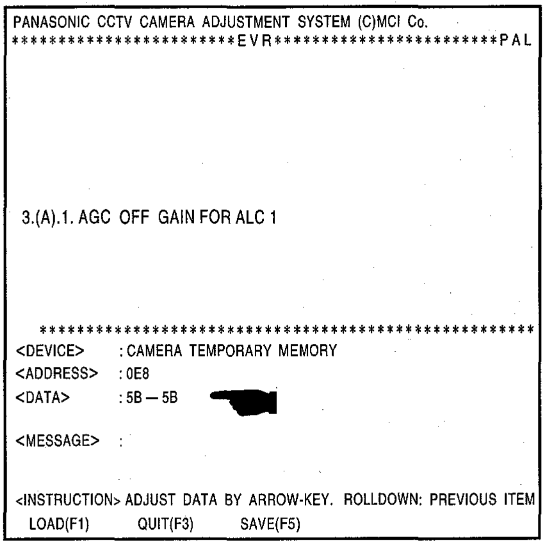
(3).A.1. AGC OFF GAIN FOR ALC1 Adjustment

Test Point: **Pin 1 of CN5 (CDS OUT)** **Digital Board**

Pin 3 of CN5 (AGC OUT) **Digital Board**

Adjust: **RAM (0E8)** **Digital Board**

- The menu as shown in Table 4-6 will be displayed.



```
PANASONIC CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
************************EVR************************PAL



3.(A).1. AGC OFF GAIN FOR ALC 1



  *****************************************************
<DEVICE>       : CAMERA TEMPORARY MEMORY
<ADDRESS>      : 0E8
<DATA>         : 5B — 5B

<MESSAGE>      :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY.  ROLLDOWN: PREVIOUS ITEM
  LOAD(F1)        QUIT(F3)        SAVE(F5)
```

Table 4-6

- Aim the Camera at the Logarithmic Gray Scale Chart.
- Connect the Oscilloscope to the pin 1 of CN5.
- Adjust data with the **ARROW** keys so that AGC OUT signal level becomes 460 mV as shown in Fig. 4-4.

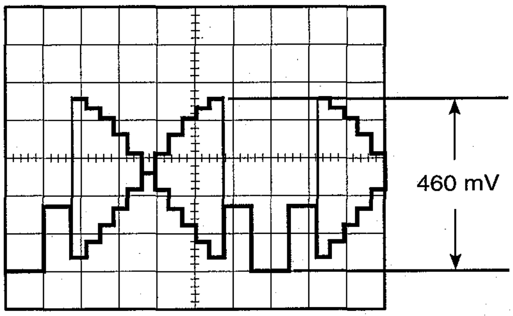


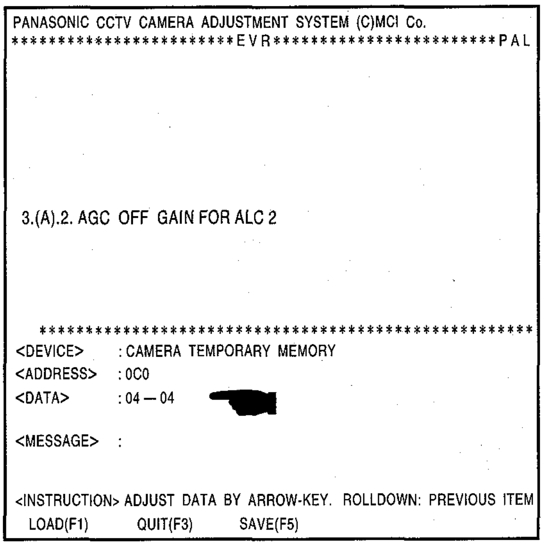
Fig. 4-4

- Press the **ENTER** key for next adjustment.

(3).A.2. AGC OFF GAIN FOR ALC2 Adjustment

Test Point:	**Pin 1 of CN5 (CDS OUT)**	**Digital Board**
	Pin 3 of CN5 (AGC OUT)	**Digital Board**
Adjust:	**RAM (0C0)**	**Digital Board**

- The menu as shown in Table 4-7 will be displayed.



```
PANASONIC CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
************************EVR************************PAL



3.(A).2. AGC OFF GAIN FOR ALC 2



  *****************************************************
<DEVICE>       : CAMERA TEMPORARY MEMORY
<ADDRESS>      : 0C0
<DATA>         : 04 — 04

<MESSAGE>      :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY.  ROLLDOWN: PREVIOUS ITEM
  LOAD(F1)        QUIT(F3)        SAVE(F5)
```

Table 4-7

- Aim the Camera at the Logarithmic Gray Scale Chart.
- Connect the Oscilloscope to the pin 3 of CN5.
- Adjust data with the **ARROW** keys so that AGC OUT signal level becomes 690 ± 30 mV as shown in Fig. 4-5.

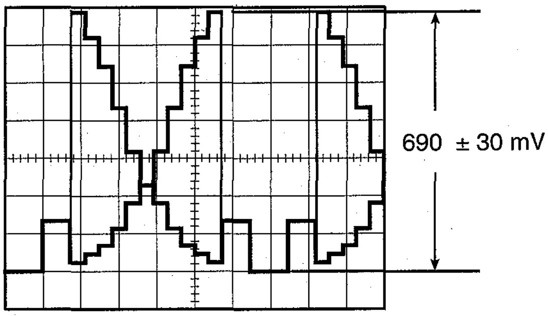


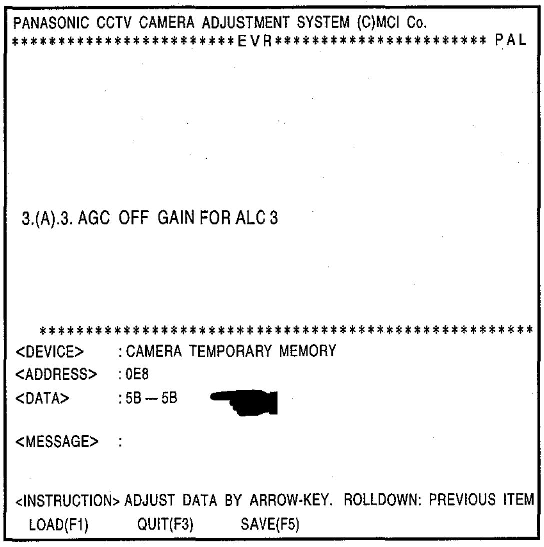
Fig. 4-5

- Press the **ENTER** key for next adjustment.

(3).A.3. AGC OFF GAIN FOR ALC3 Adjustment

Test Point:	**Pin 1 of CN5 (CDS OUT)**	**Digital Board**
	Pin 3 of CN5 (AGC OUT)	**Digital Board**
Adjust:	**RAM (0E8)**	**Digital Board**

- The menu as shown in Table 4-8 will be displayed.



```
PANASONIC CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
************************EVR************************ PAL



3.(A).3. AGC OFF GAIN FOR ALC 3


 ****************************************************
<DEVICE>     : CAMERA TEMPORARY MEMORY
<ADDRESS>    : 0E8
<DATA>       : 5B - 5B

<MESSAGE>    :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY.  ROLLDOWN: PREVIOUS ITEM
 LOAD(F1)      QUIT(F3)       SAVE(F5)
```

Table 4-8

- Aim the Camera at the Logarithmic Gray Scale Chart.
- Connect the Oscilloscope to the pin 3 of CN5.
- Adjust data with the **ARROW** keys so that AGC OUT signal level becomes 690 ± 30 mV as shown in Fig. 4-6.

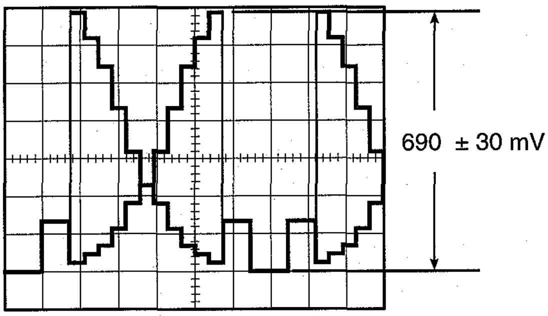


Fig. 4-6

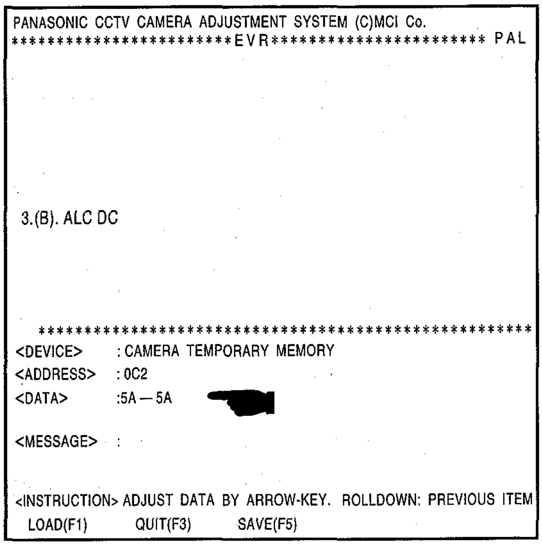
- Press the **ENTER** key for next adjustment.

(3).B. ALC DC Adjustment

Test Point: **RAM (0D5)** **Digital Board**

Adjust: **RAM (0C2)** **Digital Board**

- The menu as shown in Table 4-9 will be displayed.



```
PANASONIC CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
************************EVR************************ PAL



3.(B). ALC DC


 ****************************************************
<DEVICE>     : CAMERA TEMPORARY MEMORY
<ADDRESS>    : 0C2
<DATA>       :5A - 5A

<MESSAGE>    :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY.  ROLLDOWN: PREVIOUS ITEM
 LOAD(F1)      QUIT(F3)       SAVE(F5)
```

Table 4-9

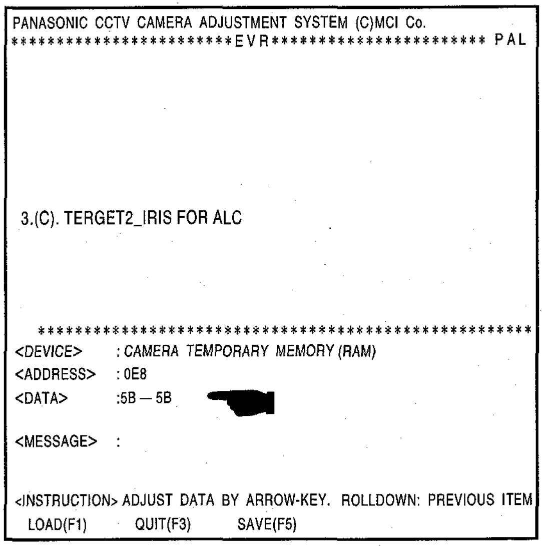
- Aim the Camera at the Logarithmic Gray Scale Chart.
- Adjust data with the **ARROW** keys so that the measure data becomes 04h or 03h.
- Press the **ENTER** key for next adjustment.

(3).C. TARGET2_IRIS FOR ALC Adjustment

Test Point: **Pin 1 of CN5 (CDS OUT)** **Digital Board**

Adjust: **RAM (0E8)** **Digital Board**

- The menu as shown in Table 4-10 will be displayed.



```
PANASONIC CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
************************EVR************************ PAL



3.(C). TERGET2_IRIS FOR ALC


 ****************************************************
<DEVICE>     : CAMERA TEMPORARY MEMORY (RAM)
<ADDRESS>    : 0E8
<DATA>       :5B - 5B

<MESSAGE>    :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY.  ROLLDOWN: PREVIOUS ITEM
 LOAD(F1)      QUIT(F3)       SAVE(F5)
```

Table 4-10

- Aim the Camera at the Logarithmic Gray Scale Chart.
- Connect the Oscilloscope to the pin 1 of CN5.
- Adjust data with the **ARROW** keys so that CDS OUT signal level becomes 460 ± 30 mV as shown in Fig. 4-7.

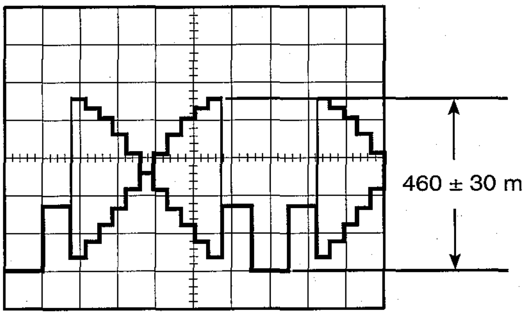


Fig. 4-7

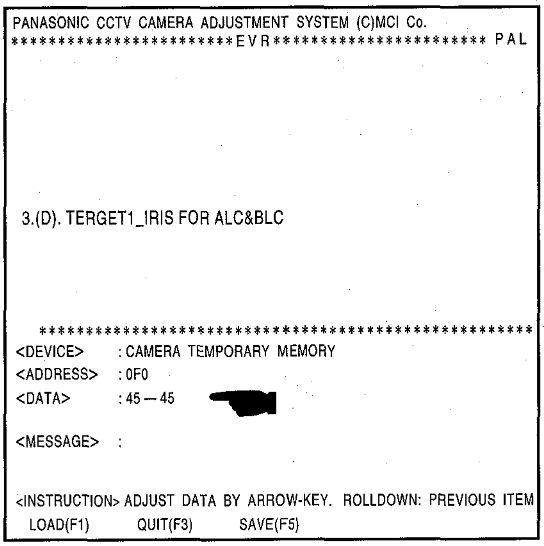
- Press the **ENTER** key for next adjustment.

(3).D. TARGET1_IRIS FOR ALC&BLC Adjustment

Test Point: **Pin 1 of CN5 (CDS OUT)** **Digital Board**

Adjust: **RAM (0F0)** **Digital Board**

- The menu as shown in Table 4-11 will be displayed.



```
PANASONIC CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
************************EVR*********************** PAL



3.(D). TERGET1_IRIS FOR ALC&BLC


 ****************************************************
<DEVICE>     : CAMERA TEMPORARY MEMORY
<ADDRESS>    : 0F0
<DATA>       : 45 — 45

<MESSAGE>    :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY.  ROLLDOWN: PREVIOUS ITEM
  LOAD(F1)       QUIT(F3)       SAVE(F5)
```

Table 4-11

- Aim the Camera at the Logarithmic Gray Scale Chart.
- Connect the Oscilloscope to the pin 1 of CN5.
- Adjust data with the **ARROW** keys so that CDS OUT signal level becomes 460 ± 30 mV as shown in Fig. 4-8.

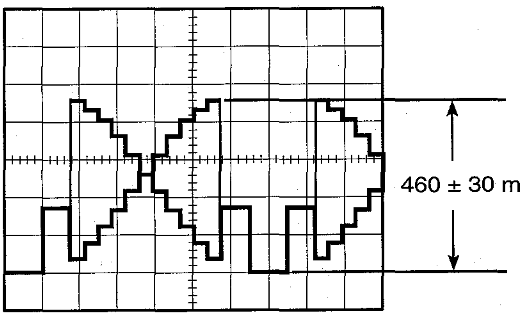


Fig. 4-8

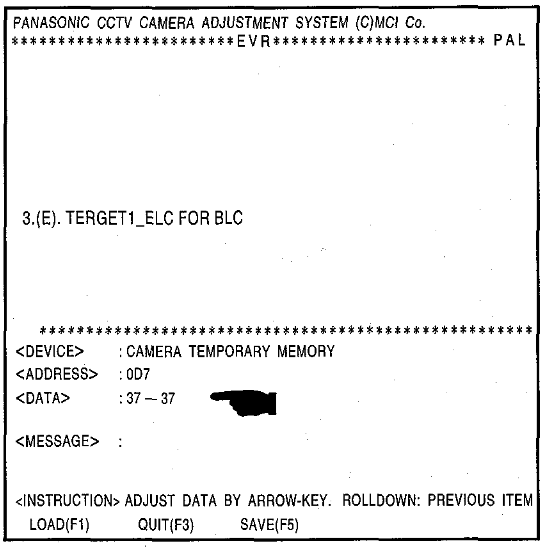
- Press the **ENTER** key for next adjustment.

(3).E. TARGET1_ELC FOR BLC Adjustment

Test Point: **Pin 3 of CN5 (AGC OUT)** **Digital Board**

Adjust: **RAM (0D7)** **Digital Board**

- The menu as shown in Table 4-12 will be displayed.



```
PANASONIC CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
************************EVR*********************** PAL



3.(E). TERGET1_ELC FOR BLC


 ****************************************************
<DEVICE>     : CAMERA TEMPORARY MEMORY
<ADDRESS>    : 0D7
<DATA>       : 37 — 37

<MESSAGE>    :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY.  ROLLDOWN: PREVIOUS ITEM
  LOAD(F1)       QUIT(F3)       SAVE(F5)
```

Table 4-12

- Aim the Camera at the Logarithmic Gray Scale Chart.
- Connect the Oscilloscope to the pin 3 of CN5.
- Adjust data with the **ARROW** keys so that AGC OUT signal level becomes 690 ± 30 mV as shown in Fig. 4-9.

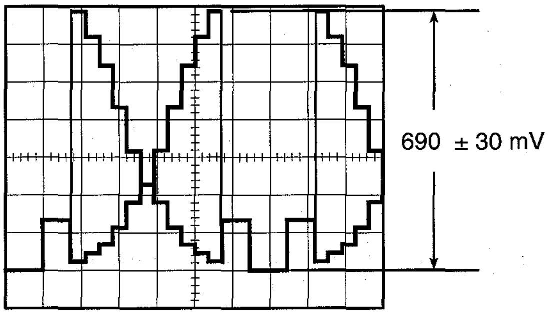


Fig. 4-9

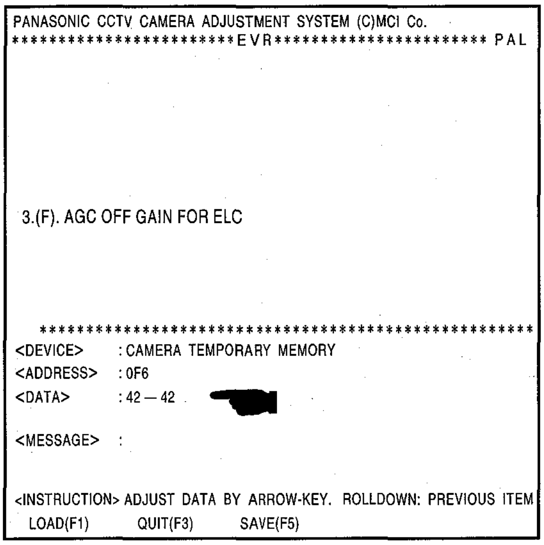
- Press the **ENTER** key for next adjustment.

(3).F. AGC OFF GAIN FOR ELC Adjustment

Test Point: **Pin 1 of CN5 (CDS OUT)** **Digital Board**

Adjust: **RAM (0F6)** **Digital Board**

- The menu as shown in Table 4-13 will be displayed.



```
PANASONIC CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
************************EVR************************ PAL



3.(F). AGC OFF GAIN FOR ELC


  ****************************************************
<DEVICE>     : CAMERA TEMPORARY MEMORY
<ADDRESS>    : 0F6
<DATA>       : 42 — 42

<MESSAGE>    :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY.  ROLLDOWN: PREVIOUS ITEM
  LOAD(F1)        QUIT(F3)        SAVE(F5)
```

Table 4-13

- Aim the Camera at the Logarithmic Gray Scale Chart.
- Connect the Oscilloscope to the pin 1 of CN5.
- Adjust data with the **ARROW** keys so that CDS OUT signal level becomes 460 ± 30 mV as shown in Fig. 4-10.

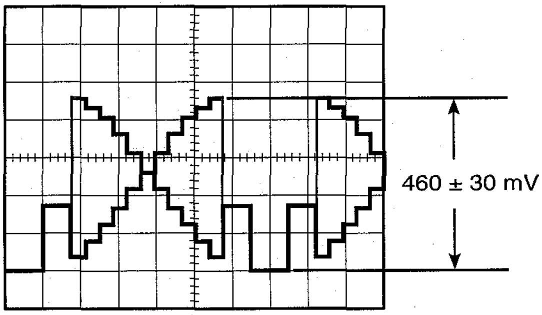


Fig. 4-10

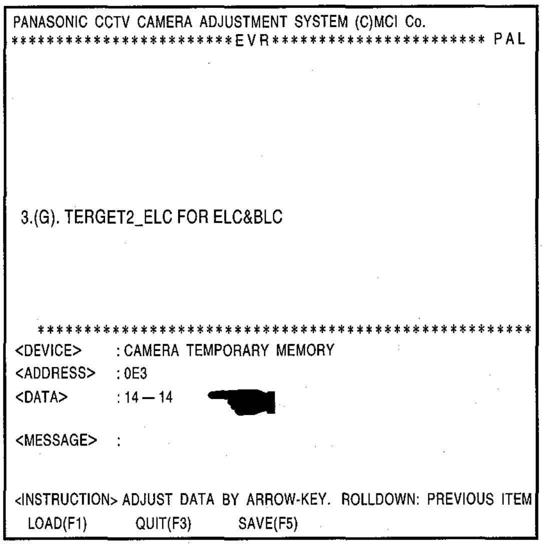
- Press the **ENTER** key for next adjustment.

(3).G. AGC OFF GAIN FOR ELC Adjustment

Test Point: **Pin 1 of CN5 (CDS OUT)** **Digital Board**

Adjust: **RAM (0E3)** **Digital Board**

- The menu as shown in Table 4-14 will be displayed.



```
PANASONIC CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
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3.(G). TERGET2_ELC FOR ELC&BLC


  ****************************************************
<DEVICE>     : CAMERA TEMPORARY MEMORY
<ADDRESS>    : 0E3
<DATA>       : 14 — 14

<MESSAGE>    :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY.  ROLLDOWN: PREVIOUS ITEM
  LOAD(F1)        QUIT(F3)        SAVE(F5)
```

Table 4-14

- Aim the Camera at the Logarithmic Gray Scale Chart.
- Connect the Oscilloscope to the pin 1 of CN5.
- Adjust data with the **ARROW** keys so that CDS OUT signal level becomes 460 ± 30 mV as shown in Fig. 4-11.

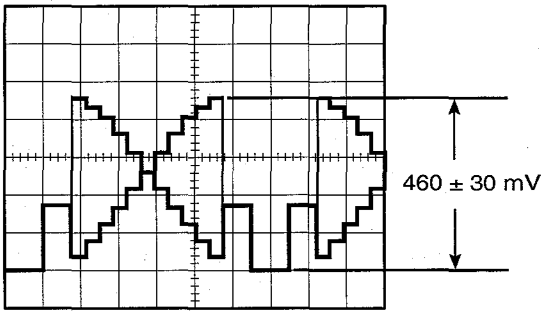


Fig. 4-11

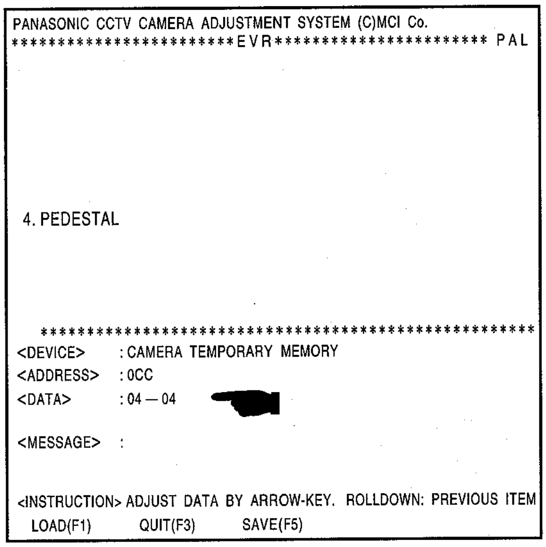
- Press the **ENTER** key for next adjustment.

(4) PEDESTAL Adjustment

Test Point: **Video Output Connector**

Adjust: **RAM (0CC)** **Digital Board**

- The menu as shown in Table 4-14 will be displayed.



```
PANASONIC CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
************************EVR*********************** PAL

4. PEDESTAL

*****************************************************
<DEVICE>     : CAMERA TEMPORARY MEMORY
<ADDRESS>    : 0CC
<DATA>       : 04 — 04

<MESSAGE>    :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY.  ROLLDOWN: PREVIOUS ITEM
  LOAD(F1)      QUIT(F3)      SAVE(F5)
```

Table 4-14

- Cap on the Lens.
- Connect the terminated Oscilloscope with 75 Ω to the Video Output Connector.
- Adjust data with the **ARROW** keys so that the Pedestal level becomes 50 ± 5 mV as shown in Fig. 4-12.

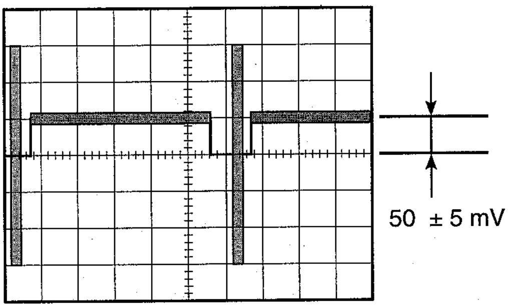


Fig. 4-12

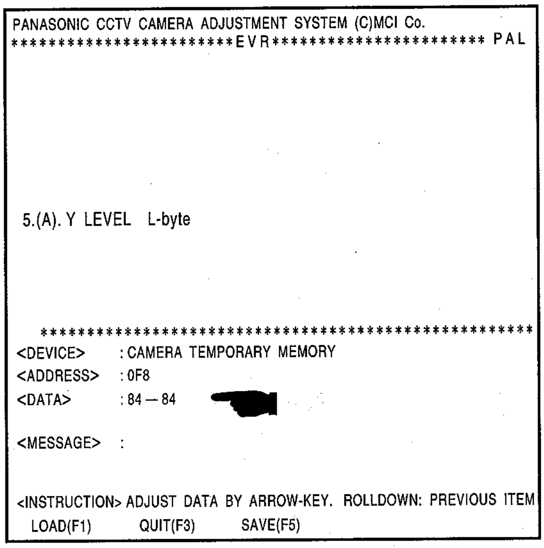
- Press the **ENTER** key for next adjustment.

(5).A. Y LEVEL L-byte Adjustment

Test Point: Video Output Connector

Adjust: RAM (0F8) Digital Board

- The menu as shown in Table 4-15 will be displayed.



```
PANASONIC CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
************************EVR*********************** PAL

5.(A). Y LEVEL  L-byte

*****************************************************
<DEVICE>     : CAMERA TEMPORARY MEMORY
<ADDRESS>    : 0F8
<DATA>       : 84 — 84

<MESSAGE>    :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY.  ROLLDOWN: PREVIOUS ITEM
  LOAD(F1)      QUIT(F3)      SAVE(F5)
```

Table 4-15

- Aim the Camera at the Logarithmic Gray Scale Chart.
- Connect the terminated Oscilloscope with 75 Ω to the Video Output Connector.
- Adjust data with the **ARROW** keys so that the Y level becomes 700 ± 50 mV as shown in Fig. 4-13.

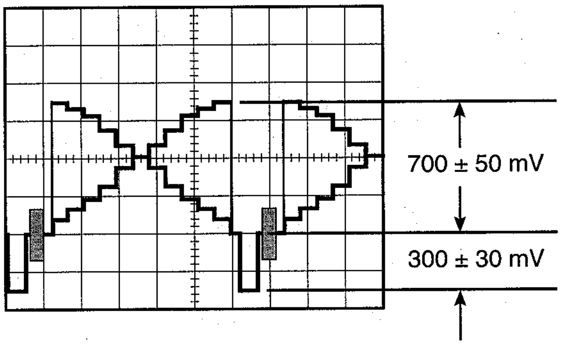


Fig. 4-13

(5).B. SYNC LEVEL Confirmation

Test Point: Video Output Connector

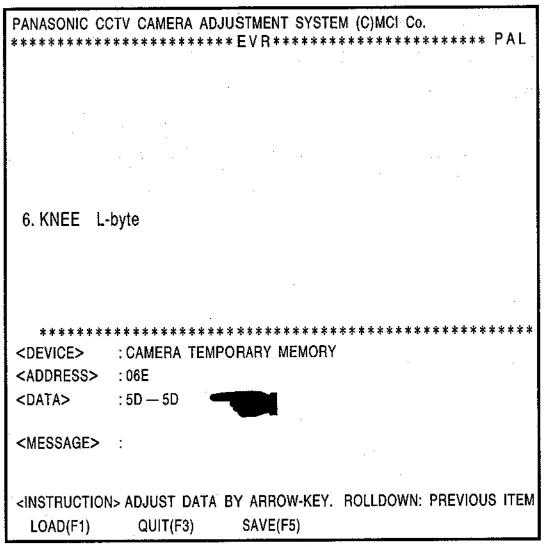
- Aim the Camera at the Logarithmic Gray Scale Chart.
- Connect the terminated Oscilloscope with 75 Ω to the Video Output Connector.
- Confirm that the Sync Level should be within 300 ± 30 mV as shown in Fig. 4-13.
- Press the **ENTER** key for next adjustment.

(6). KNEE LEVEL Adjustment

Test Point: Video Output Connector

Adjust: RAM (06E) Digital Board

- The menu as shown in Table 4-16 will be displayed.

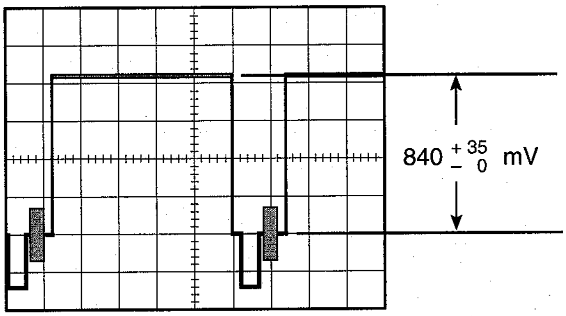


```
PANASONIC CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
************************EVR*********************** PAL



 6. KNEE  L-byte



  ****************************************************
<DEVICE>    : CAMERA TEMPORARY MEMORY
<ADDRESS>   : 06E
<DATA>      : 5D — 5D

<MESSAGE>   :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY.  ROLLDOWN: PREVIOUS ITEM
  LOAD(F1)       QUIT(F3)       SAVE(F5)
```

Table 4-16

- Aim the Camera at the Logarithmic Gray Scale Chart.
- Connect the terminated Oscilloscope with 75 Ω to the Video Output Connector.
- Adjust data with the **ARROW** keys so that the Y level becomes 840 $^{+35}_{-0}$ mV as shown in Fig. 4-14.

Fig. 4-14



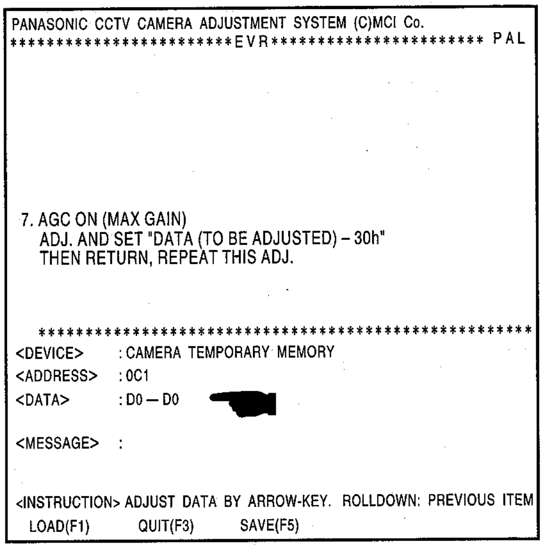
- Press the **ENTER** key for next adjustment.

(7). AGC ON (MAX GAIN) Adjustment

Test Point: **Video Output Connector**

Adjust: **RAM (0C1)** **Digital Board**

- The menu as shown in Table 4-17 will be displayed.



```
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 7. AGC ON (MAX GAIN)
    ADJ. AND SET "DATA (TO BE ADJUSTED) - 30h"
    THEN RETURN, REPEAT THIS ADJ.


  ****************************************************
<DEVICE>    : CAMERA TEMPORARY MEMORY
<ADDRESS>   : 0C1
<DATA>      : D0 — D0

<MESSAGE>   :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY.  ROLLDOWN: PREVIOUS ITEM
  LOAD(F1)       QUIT(F3)       SAVE(F5)
```

Table 4-17

- Aim the Camera at the Logarithmic Gray Scale Chart.
- Connect the terminated Oscilloscope with 75 Ω to the Video Output Connector.
- Change the lighting from 2,750 lux to 3 lux.
- Adjust data with the **ARROW** keys so that the signal level becomes more than 280 ± 35 mV as shown in Fig. 4-15, and note this data as (a).

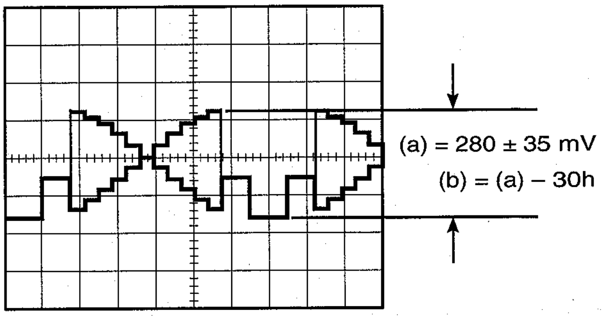


Fig. 4-15

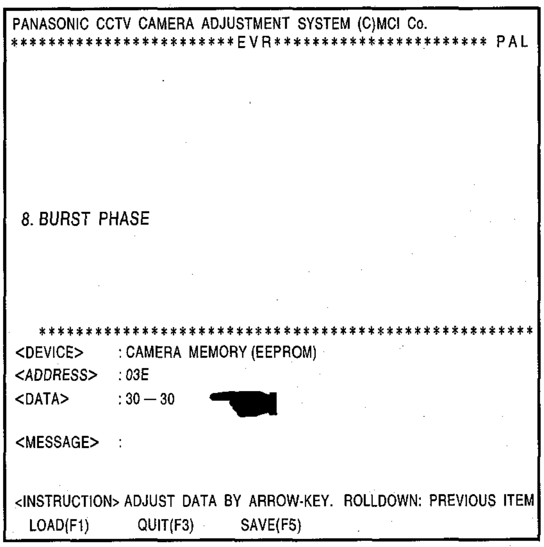
- Readjust data with the **ARROW** keys so that the data becomes (b).
  (a) – 30h = (b)
- Return the lighting from 3 lux to 2,750 lux.
- Press the **ENTER** key for next adjustment.

(8). BURST PHASE Adjustment

Test Point: **Video Output Connector**

Adjust: **RAM (03E)** **Digital Board**

- The menu as shown in Table 4-18 will be displayed.



```
PANASONIC CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
************************EVR*********************** PAL


8. BURST PHASE


*****************************************************
<DEVICE>      : CAMERA MEMORY (EEPROM)
<ADDRESS>     : 03E
<DATA>        : 30 — 30

<MESSAGE>     :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY.  ROLLDOWN: PREVIOUS ITEM
  LOAD(F1)        QUIT(F3)        SAVE(F5)
```

Table 4-18

- Aim the Camera at the Logarithmic Gray Scale Chart.
- Set the Mode Switch of the Vectorscope to the "NTSC" mode.
- Adjust data with the **ARROW** keys so that the Burst Phase becomes 135 ± 1 ° as shown in Fig. 4-16-1.

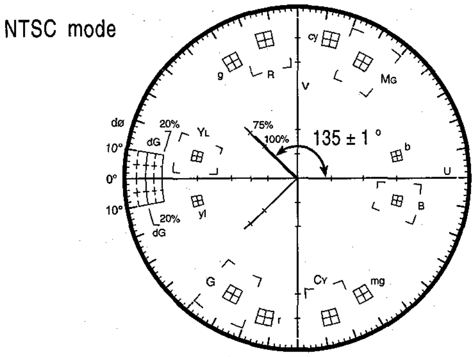


Fig. 4-16-1

- Change the Mode Switch of the Vectorscope from the "NTSC" mode to the "PAL" mode.
- Adjust data with the **ARROW** keys so that the Burst Phase becomes 90 ± 2 ° as shown in Fig. 4-16-2.

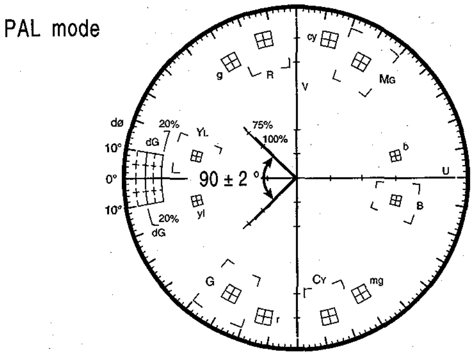


Fig. 4-16-2

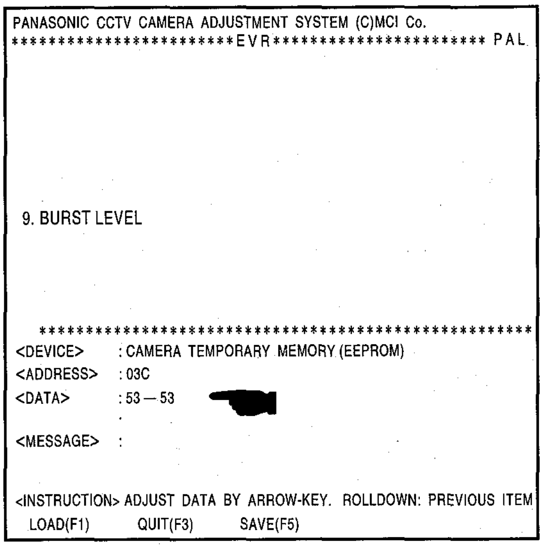
- Press the **ENTER** key for next adjustment.

(9). BURST LEVEL Adjustment

Test Point: **Video Output Connector**

Adjust: **RAM (03C)** **Digital Board**

- The menu as shown in Table 4-19 will be displayed.



```
PANASONIC CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
************************EVR*********************** PAL


9. BURST LEVEL


*****************************************************
<DEVICE>      : CAMERA TEMPORARY MEMORY (EEPROM)
<ADDRESS>     : 03C
<DATA>        : 53 — 53

<MESSAGE>     :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY.  ROLLDOWN: PREVIOUS ITEM
  LOAD(F1)        QUIT(F3)        SAVE(F5)
```

Table 4-19

- Aim the Camera at the Logarithmic Gray Scale Chart.
- Connect the terminated Oscilloscope with 75 Ω to the Video Output Connector.
- Adjust data with the **ARROW** keys so that the Burst signal level becomes 300 ± 10 mV as shown in Fig. 4-17.

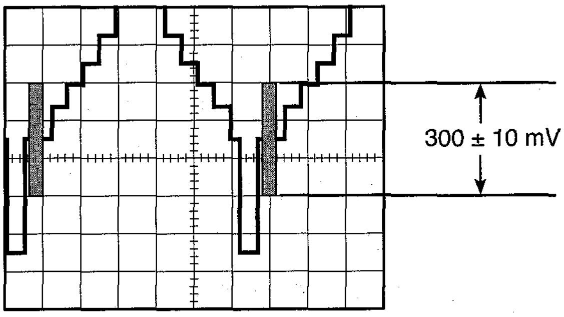


Fig. 4-17

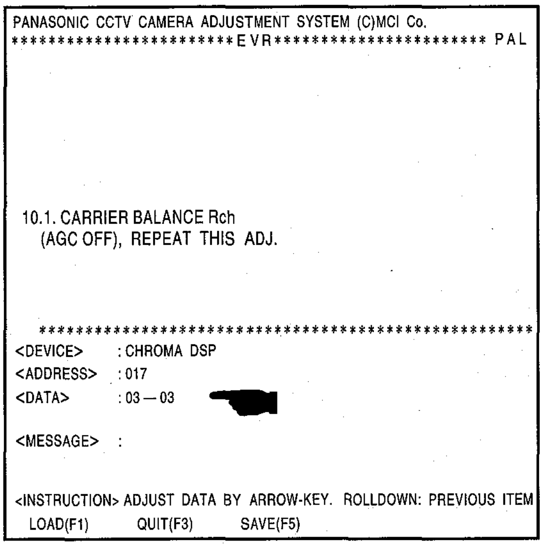
- Press the **ENTER** key for next adjustment.

(10).1. CARRIER BALANCE Rch Adjustment

Test Point: **Video Output Connector**

Adjust: **C.DSP (017)** **Digital Board**

- The menu as shown in Table 4-20 will be displayed.



```
PANASONIC CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
************************EVR*********************** PAL



 10.1. CARRIER BALANCE Rch
   (AGC OFF), REPEAT THIS ADJ.


   ****************************************************
<DEVICE>    : CHROMA DSP
<ADDRESS>   : 017
<DATA>      : 03 — 03

<MESSAGE>   :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY.  ROLLDOWN: PREVIOUS ITEM
  LOAD(F1)       QUIT(F3)       SAVE(F5)
```

Table 4-20

- Cap on the Lens.
- Set the Gain Control of the Vectorscope to maximum.
- Adjust data with the **ARROW** keys so that the vector positions at the center of the Vectorscope as shown in Fig. 4-18.

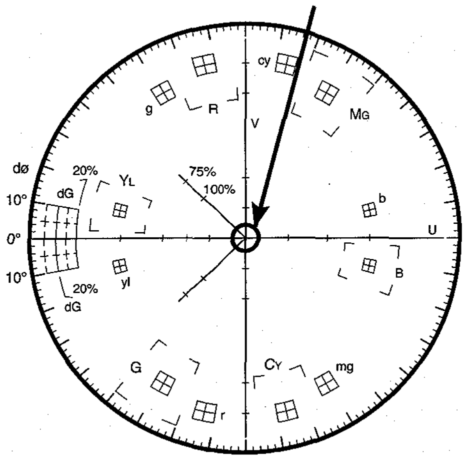


Fig. 4-18

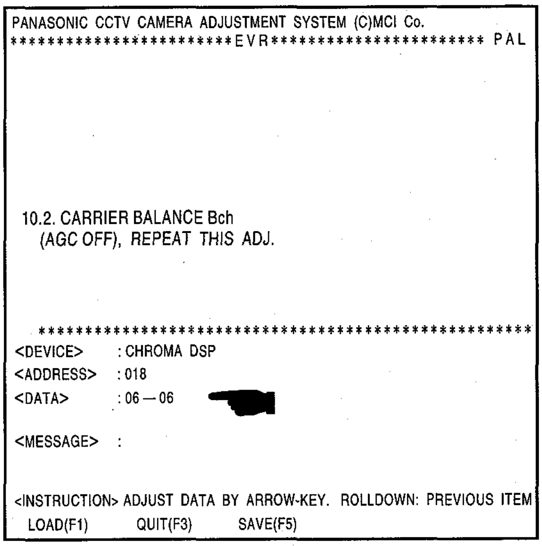
- Press the **ENTER** key for next adjustment.

(10).2. CARRIER BALANCE Bch Adjustment

Test Point: **Video Output Connector**

Adjust: **C.DSP (018)** **Digital Board**

- The menu as shown in Table 4-21 will be displayed.



```
PANASONIC CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
************************EVR*********************** PAL



 10.2. CARRIER BALANCE Bch
   (AGC OFF), REPEAT THIS ADJ.


   ****************************************************
<DEVICE>    : CHROMA DSP
<ADDRESS>   : 018
<DATA>      : 06 — 06

<MESSAGE>   :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY.  ROLLDOWN: PREVIOUS ITEM
  LOAD(F1)       QUIT(F3)       SAVE(F5)
```

Table 4-21

- Cap on the Lens.
- Set the Gain Control of the Vectorscope to maximum.
- Adjust data with the **ARROW** keys so that the vector positions at the center of the Vectorscope as shown in Fig. 4-19.

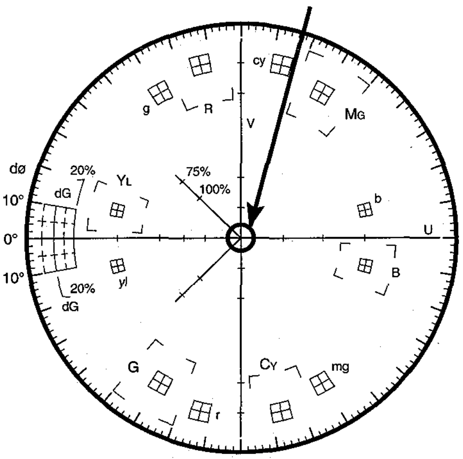


Fig. 4-19

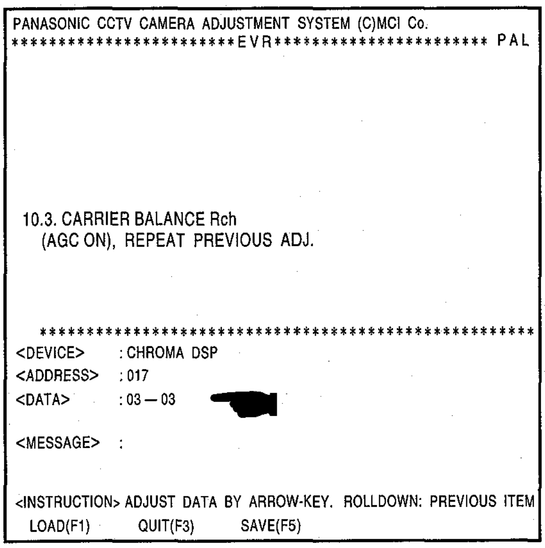
- Press the **ENTER** key for next adjustment.

(10).3. CARRIER BALANCE Rch Adjustment

Test Point: **Video Output Connector**

Adjust: **C.DSP (017)** **Digital Board**

- The menu as shown in Table 4-22 will be displayed.



```
PANASONIC CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
************************EVR************************ PAL




 10.3. CARRIER BALANCE Rch
   (AGC ON), REPEAT PREVIOUS ADJ.


  *************************************************
<DEVICE>     : CHROMA DSP
<ADDRESS>    : 017
<DATA>       : 03 — 03

<MESSAGE>  :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY. ROLLDOWN: PREVIOUS ITEM
   LOAD(F1)      QUIT(F3)      SAVE(F5)
```

Table 4-22

- Cap on the Lens.
- Set the Gain Control of the Vectorscope to maximum.
- Adjust data with the **ARROW** keys so that the vector positions at the center of the Vectorscope as shown in Fig. 4-20.

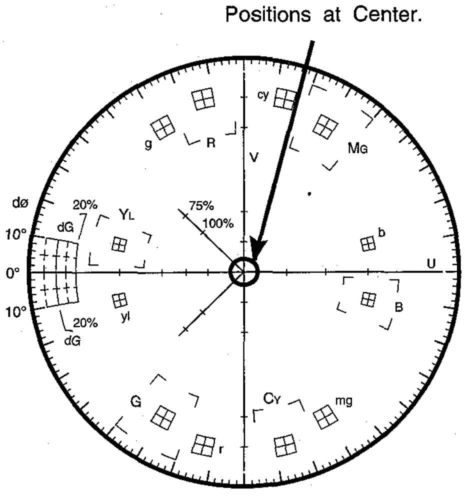


Fig. 4-20

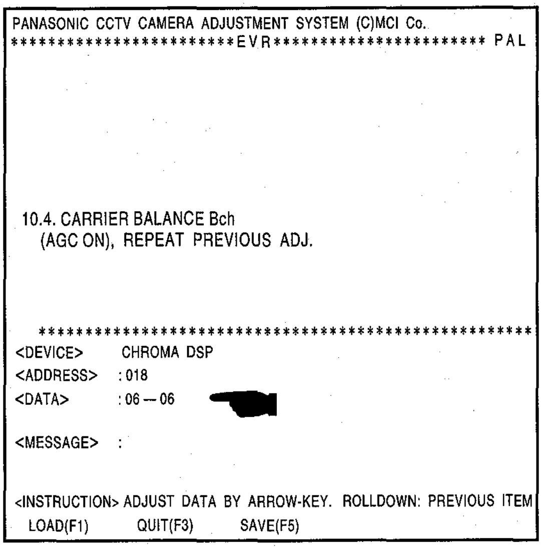
- Press the **ENTER** key for next adjustment.

(10).4. CARRIER BALANCE Bch Adjustment

Test Point: **Video Output Connector**

Adjust: **C.DSP (018)** **Digital Board**

- The menu as shown in Table 4-23 will be displayed.



```
PANASONIC CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
************************EVR************************ PAL




 10.4. CARRIER BALANCE Bch
   (AGC ON), REPEAT PREVIOUS ADJ.


  *************************************************
<DEVICE>      CHROMA DSP
<ADDRESS>   : 018
<DATA>      : 06 — 06

<MESSAGE>  :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY. ROLLDOWN: PREVIOUS ITEM
   LOAD(F1)      QUIT(F3)      SAVE(F5)
```

Table 4-23

- Cap on the Lens.
- Set the Gain Control of the Vectorscope to maximum.
- Adjust data with the **ARROW** keys so that the vector positions at the center of the Vectorscope as shown in Fig. 4-21.

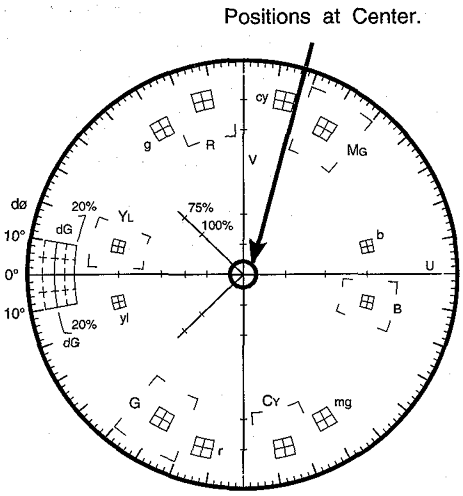


Fig. 4-21

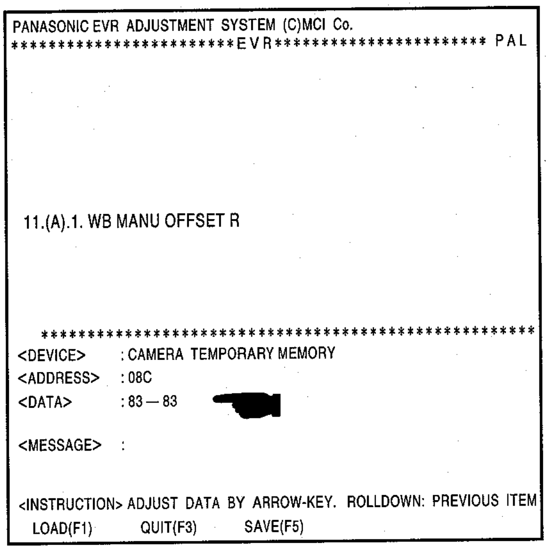
- If the vector does not positions at center of the Vectorscope, press the **PG DN** key four times to return (9).1., and repeat above procedure until the vector positions at center of the Vectorscope as shown in Fig. 4-20.
- Press the **ENTER** key for next adjustment.

(11).(A).1. WB MANU OFFSET Rch Adjustment

Test Point: **Video Output Connector**

Adjust: **RAM (08C)** **Digital Board**

- The menu as shown in Table 4-24 will be displayed.



```
PANASONIC EVR ADJUSTMENT SYSTEM (C)MCI Co.
************************EVR************************ PAL

 11.(A).1. WB MANU OFFSET R

  ******************************************************
<DEVICE>     : CAMERA TEMPORARY MEMORY
<ADDRESS>    : 08C
<DATA>       : 83 — 83

<MESSAGE>    :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY.  ROLLDOWN: PREVIOUS ITEM
  LOAD(F1)        QUIT(F3)        SAVE(F5)
```

Table 4-24

- Set the Gain Control of the Vectorscope to maximum.
- Aim the Camera at the White Chart or White Paper.
- Adjust data with the **ARROW** keys so that the vector positions at the center of the Vectorscope as shown in Fig. 4-22.

Positions at Center.

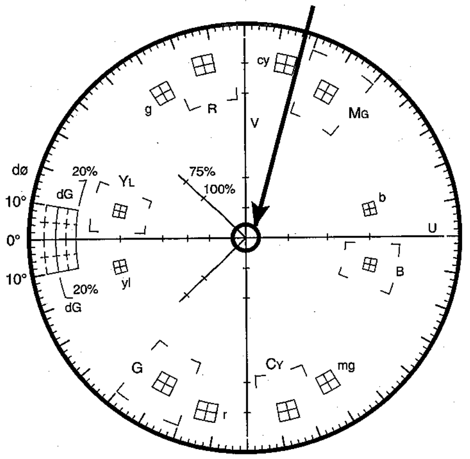


Fig. 4-22

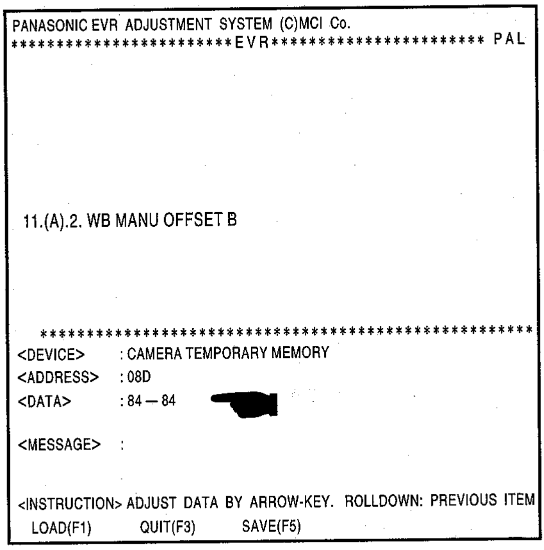
- Press the **ENTER** key for next adjustment.

(11).(A).2. WB MANU OFFSET Bch Adjustment

Test Point: Video Output Connector

Adjust: RAM (08D) Digital Board

- The menu as shown in Table 4-25 will be displayed.



```
PANASONIC EVR ADJUSTMENT SYSTEM (C)MCI Co.
************************EVR************************ PAL

 11.(A).2. WB MANU OFFSET B

  ******************************************************
<DEVICE>     : CAMERA TEMPORARY MEMORY
<ADDRESS>    : 08D
<DATA>       : 84 — 84

<MESSAGE>    :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY.  ROLLDOWN: PREVIOUS ITEM
  LOAD(F1)        QUIT(F3)        SAVE(F5)
```

Table 4-25

- Set the Gain Control of the Vectorscope to maximum.
- Aim the Camera at the White Chart or White Paper.
- Adjust data with the **ARROW** keys so that the vector positions at the center of the Vectorscope as shown in Fig. 4-23.

Positions at Center.

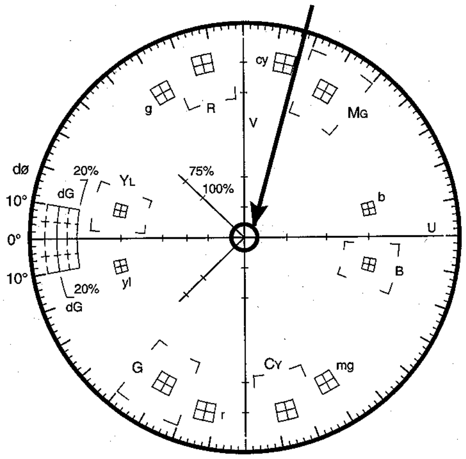


Fig. 4-23

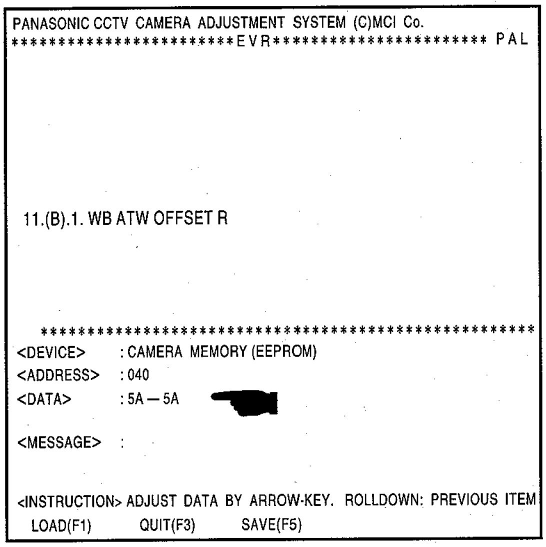
- If the vector does not positions at center of the Vectorscope, press the **PG DN** key twice to return (10).A.1., and repeat above procedure until the vector positions at center of the Vectorscope as shown in Fig. 4-23.
- Press the **ENTER** key for next adjustment.

(11).(B).1. WB ATW OFFSET Rch Adjustment

Test Point: Video Output Connector

Adjust: EEPROM (040) Digital Board

- The menu as shown in Table 4-26 will be displayed.



```
PANASONIC CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
************************EVR************************ PAL

11.(B).1. WB ATW OFFSET R

    ****************************************************
<DEVICE>     : CAMERA MEMORY (EEPROM)
<ADDRESS>    : 040
<DATA>       : 5A – 5A

<MESSAGE>  :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY.  ROLLDOWN: PREVIOUS ITEM
   LOAD(F1)      QUIT(F3)      SAVE(F5)
```

Table 4-26

- Set the Gain Control of the Vectorscope to maximum.
- Aim the Camera at the White Chart or White Paper.
- Adjust data with the **ARROW** keys so that the vector positions at the center of the Vectorscope as shown in Fig. 4-24.

Positions at Center.

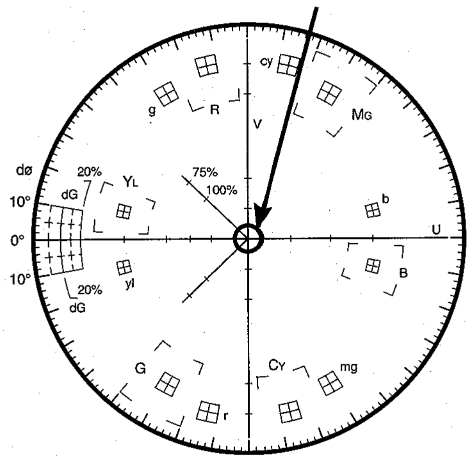


Fig. 4-24

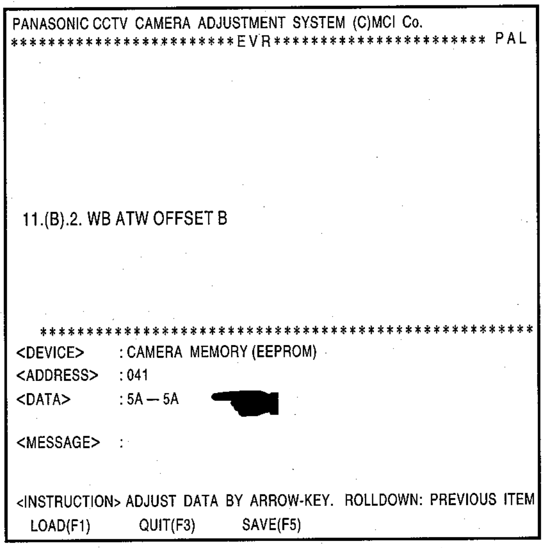
- Press the **ENTER** key for next adjustment.

(11).(B).2. WB ATW OFFSET Bch Adjustment

Test Point: Video Output Connector

Adjust: EEPROM (041) Digital Board

- The menu as shown in Table 4-27 will be displayed.



```
PANASONIC CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
************************EVR************************ PAL

11.(B).2. WB ATW OFFSET B

    ****************************************************
<DEVICE>     : CAMERA MEMORY (EEPROM)
<ADDRESS>    : 041
<DATA>       : 5A – 5A

<MESSAGE>  :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY.  ROLLDOWN: PREVIOUS ITEM
   LOAD(F1)      QUIT(F3)      SAVE(F5)
```

Table 4-27

- Set the Gain Control of the Vectorscope to maximum.
- Aim the Camera at the White Chart or White Paper.
- Adjust data with the **ARROW** keys so that the vector positions at the center of the Vectorscope as shown in Fig. 4-25.

Positions at Center.

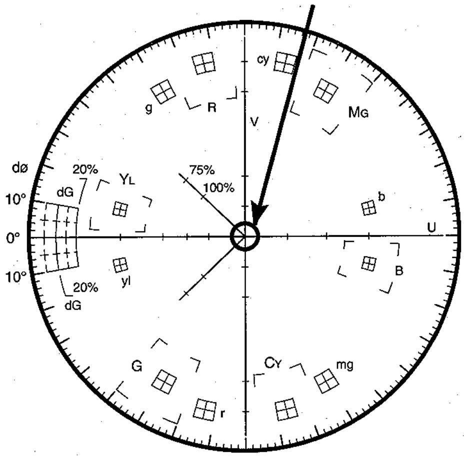


Fig. 4-25

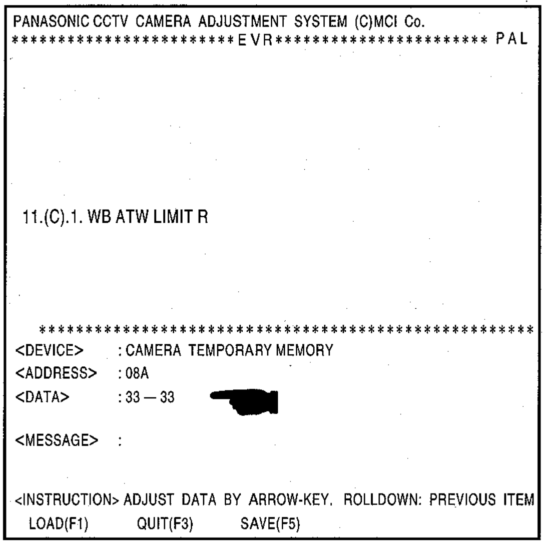
- If the vector does not positions at center of the Vectorscope, press the **PG DN** key twice to return (10).B.1., and repeat above procedure until the vector positions at center of the Vectorscope as shown in Fig. 4-25.
- Press the **ENTER** key for next adjustment.

(11).(C).1. WB ATW LIMIT Rch Adjustment

Test Point: Video Output Connector

Adjust: RAM (08A) Digital Board

- The menu as shown in Table 4-28 will be displayed.



```
PANASONIC CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
************************EVR************************ PAL

 11.(C).1. WB ATW LIMIT R

  ****************************************************
<DEVICE>     : CAMERA TEMPORARY MEMORY
<ADDRESS>    : 08A
<DATA>       : 33 — 33

<MESSAGE>    :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY. ROLLDOWN: PREVIOUS ITEM
  LOAD(F1)      QUIT(F3)      SAVE(F5)
```

Table 4-28

- Set the Gain Control of the Vectorscope to maximum.
- Set the C16 Filter on the Lens.
- Aim the Camera at the White Chart or White Paper.
- Adjust data with the **ARROW** keys so that the vector shifts 10% (burst Level = 100%) to the Cyan side of the Vectorscope as shown in Fig. 4-26.

Positions at Center.

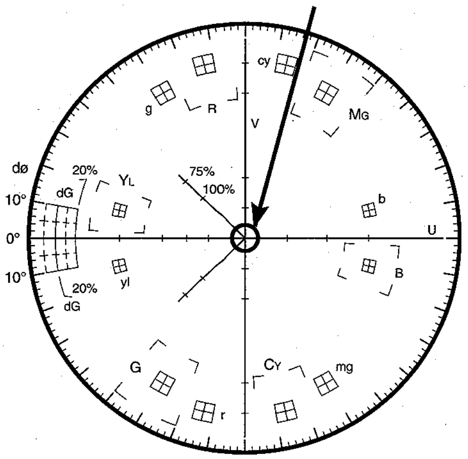


Fig. 4-26

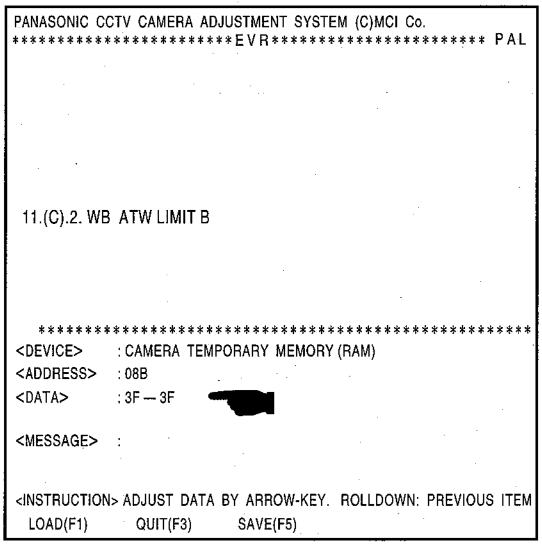
- Press the **ENTER** key for next adjustment.

(11).(C).2. WB ATW LIMIT Bch Adjustment

Test Point: **Video Output Connector**

Adjust: **RAM (08B)** **Digital Board**

- The menu as shown in Table 4-29 will be displayed.



```
PANASONIC CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
************************EVR************************ PAL

 11.(C).2. WB  ATW LIMIT B

  ****************************************************
<DEVICE>     : CAMERA TEMPORARY MEMORY (RAM)
<ADDRESS>    : 08B
<DATA>       : 3F — 3F

<MESSAGE>    :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY. ROLLDOWN: PREVIOUS ITEM
  LOAD(F1)      QUIT(F3)      SAVE(F5)
```

Table 4-29

- Set the Gain Control of the Vectorscope to maximum.
- Set the C16 Filter on the Lens.
- Aim the Camera at the White Chart or White Paper.
- Adjust data with the **ARROW** keys so that the vector shifts 10% (burst Level = 100%) to the Cyan side of the Vectorscope as shown in Fig. 4-27.

Shifts approx. 10%.

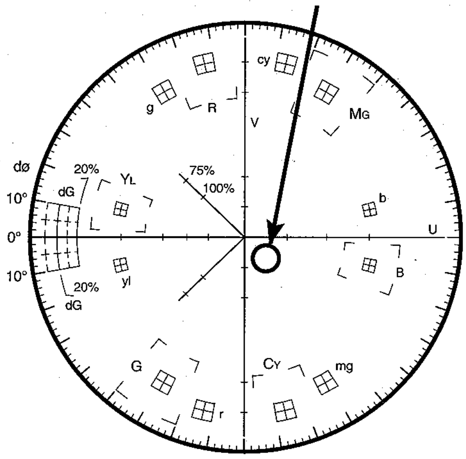


Fig. 4-27

- If the vector does not positions at center of the Vectorscope, press the **PG DN** key twice to return (10).C.1, and repeat above procedure until the vector shifts 10% to the Cyan side of the Vectorscope as shown in Fig. 4-27.
- Press the **ENTER** key for next adjustment.

(12).(A). Chroma Balance Adjustment (3,200 °K)

Test Point: **Video Output Connector**

Adjust: **RAM (08E)** **Digital Board**
RAM (08F) **Digital Board**
RAM (186) **Digital Board**

- Aim the Camera at the Color Chip Chart.
- *Set the Gain Control of the Vectorscope to 75%.*
- The chrominance phases and gains are as shown in Fig. 4-28 and Table 4-30.

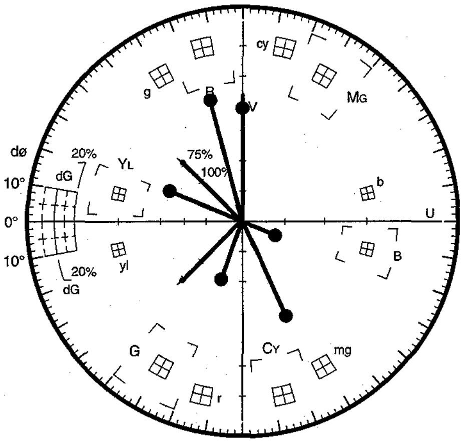


Fig. 4-28

	Red	Yellow
Phase	104 ± 2 °	157 ± 5 °
Gain	200 ± 5 %	100 ± 5 %

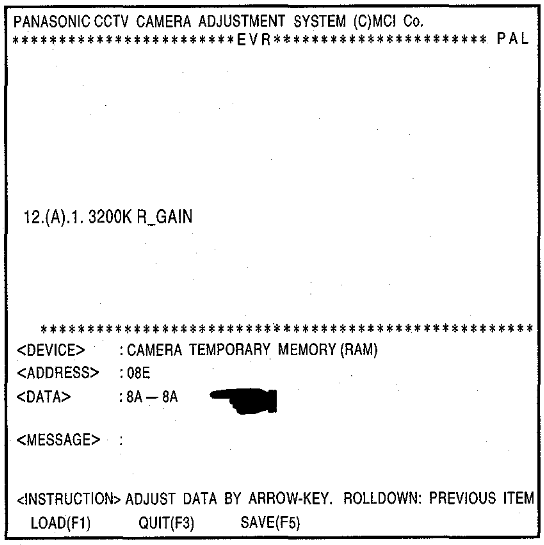
Table 4-30

(12).(A).1. 3200°K R_GAIN Adjustment

Test Point: Video Output Connector

Adjust: RAM (08E) Digital Board

- The menu as shown in Table 4-31 will be displayed.



```
PANASONIC CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
************************EVR************************ PAL




12.(A).1. 3200K R_GAIN



*****************************************************
<DEVICE>     : CAMERA TEMPORARY MEMORY (RAM)
<ADDRESS>    : 08E
<DATA>       : 8A — 8A

<MESSAGE>    :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY.  ROLLDOWN: PREVIOUS ITEM
  LOAD(F1)       QUIT(F3)       SAVE(F5)
```

Table 4-31

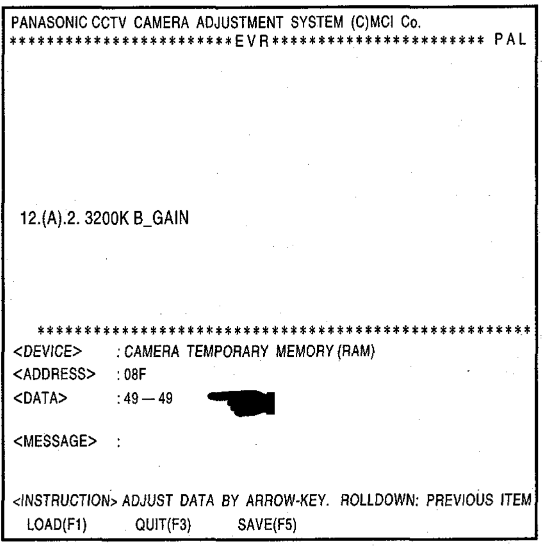
- Adjust data with the **ARROW** keys so that the Red Gain becomes 200 ± 5 % (Burst Level = 100 %).
- Press the **ENTER** key for next adjustment.

(12).(A).2. 3200°K B_GAIN Adjustment

Test Point: Video Output Connector

Adjust: RAM (08F) Digital Board

- The menu as shown in Table 4-32 will be displayed.



```
PANASONIC CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
************************EVR************************ PAL




12.(A).2. 3200K B_GAIN



*****************************************************
<DEVICE>     : CAMERA TEMPORARY MEMORY (RAM)
<ADDRESS>    : 08F
<DATA>       : 49 — 49

<MESSAGE>    :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY.  ROLLDOWN: PREVIOUS ITEM
  LOAD(F1)       QUIT(F3)       SAVE(F5)
```

Table 4-32

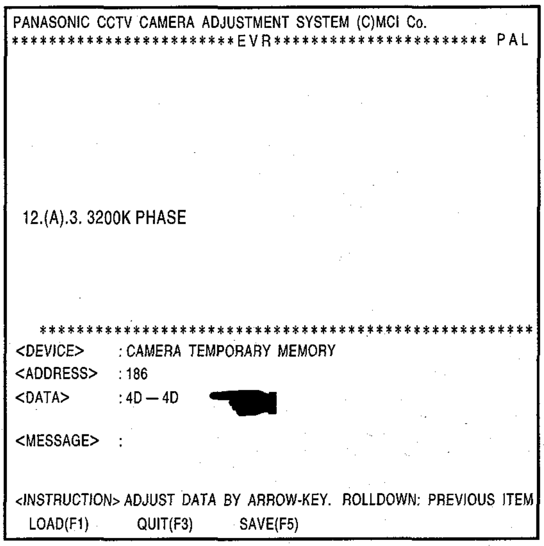
- Adjust data with the **ARROW** keys so that the Yellow Gain becomes 100 ± 5 % (Burst Level = 100 %).
- Press the **ENTER** key for next adjustment.

(12).(A).3. 3200°K PHASE Adjustment

Test Point: Video Output Connector

Adjust: RAM (186) Digital Board

- The menu as shown in Table 4-33 will be displayed.



```
PANASONIC CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
************************EVR************************ PAL




12.(A).3. 3200K PHASE



*****************************************************
<DEVICE>     : CAMERA TEMPORARY MEMORY
<ADDRESS>    : 186
<DATA>       : 4D — 4D

<MESSAGE>    :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY.  ROLLDOWN: PREVIOUS ITEM
  LOAD(F1)       QUIT(F3)       SAVE(F5)
```

Table 4-33

- Adjust data with the **ARROW** keys so that the Yellow vector becomes 157 ± 5 ° (Burst Level = 100 %).

- If the chrominance phases and gains should not be adjusted to proper positions on the Vectorscope, press the **PG DN** key three times to return (11).A.1., and repeat above procedure until they are adjusted proper positions as shown in Fig. 4-28 and Table 4-30.
- Press the **ENTER** key for next adjustment.

(12).(B). Chroma Balance Adjustment (5,100 °K)

Test Point: **Video Output Connector**

Adjust: **RAM (090)** **Digital Board**

RAM (091) **Digital Board**

- Mount the Color Temperature Conversion Filter C12 which converts from 3,200 °K to 5,100 °K on the Lens.
- Aim the Camera at the Color Chip Chart.
- Set the gain control of the Vectorscope to 75%.
- The chrominance phases and gains are as shown in Fig. 4-29 and Table 4-34.

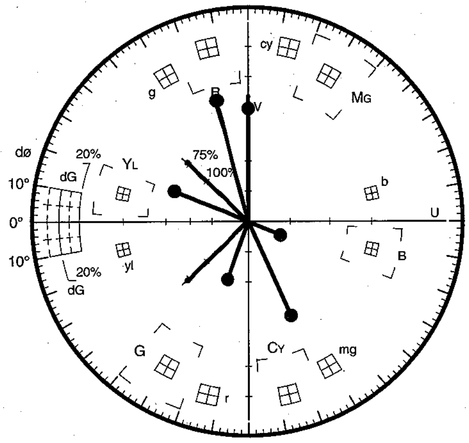


Fig. 4-29

Table 4-34

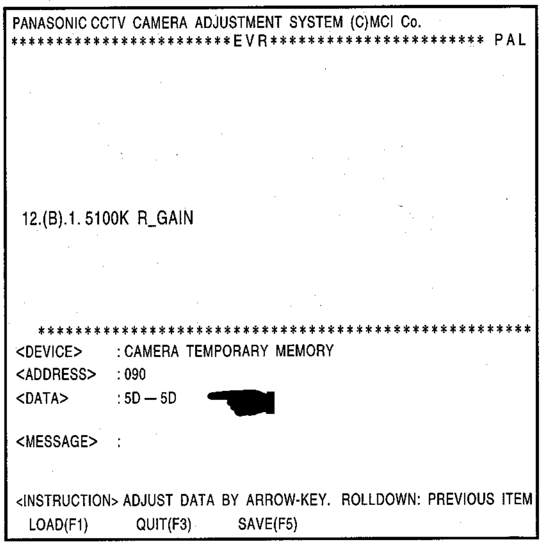
	Red	Yellow
Phase	104 ± 2 °	157 ± 5 °
Gain	200 ± 5 %	90 ± 5 %

(12).(B).1. 5100°K R_GAIN Adjustment

Test Point: **Video Output Connector**

Adjust: **RAM (090)** **Digital Board**

- The menu as shown in Table 4-35 will be displayed.



```
PANASONIC CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
************************EVR*********************** PAL




12.(B).1. 5100K R_GAIN



***************************************************
<DEVICE>     : CAMERA TEMPORARY MEMORY
<ADDRESS>    : 090
<DATA>       : 5D — 5D

<MESSAGE>    :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY.  ROLLDOWN: PREVIOUS ITEM
 LOAD(F1)        QUIT(F3)        SAVE(F5)
```

Table 4-35

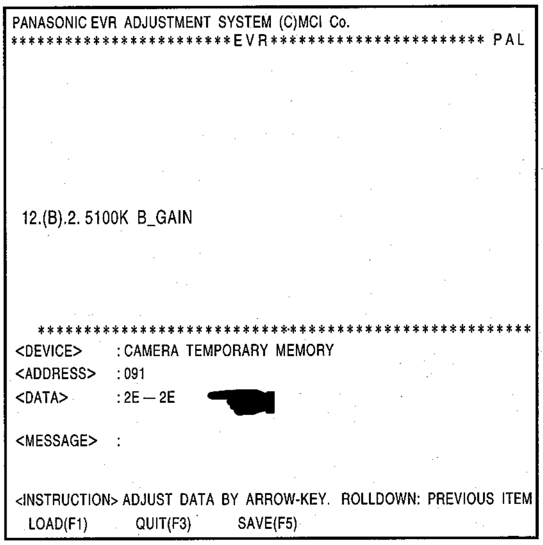
- Adjust data with the **ARROW** keys so that the Red Gain becomes 200 ± 5 % (Burst Level = 100%).
- Press the **ENTER** key for next adjustment.

(12).(B).2. 5100°K B_GAIN Adjustment

Test Point: **Video Output Connector**

Adjust: **RAM (091)** **Digital Board**

- The menu as shown in Table 4-36 will be displayed.



```
PANASONIC EVR ADJUSTMENT SYSTEM (C)MCI Co.
************************EVR*********************** PAL




12.(B).2. 5100K B_GAIN



***************************************************
<DEVICE>     : CAMERA TEMPORARY MEMORY
<ADDRESS>    : 091
<DATA>       : 2E — 2E

<MESSAGE>    :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY.  ROLLDOWN: PREVIOUS ITEM
 LOAD(F1)        QUIT(F3)        SAVE(F5)
```

Table 4-36

- Adjust data with the **ARROW** keys so that the Yellow Gain becomes 90 ± 5 % (Burst Level = 100%).
- If the chrominance phases and gains should not be adjusted to proper positions on the Vectorscope, press the **PG DN** key three times to return (11).B.1., and repeat above procedure until they are adjusted proper positions as shown in Fig. 4-29 and Table 4-34.

- Remove the Color Temperature Conversion Filter C12 from the Lens.
- Press the **ENTER** key for next adjustment.

(13) HIGHLIGHT CHROMA CLIP Adjustment

Test Point: Video Output Connector

Adjust: RAM (0AA) Digital Board

- The menu as shown in Table 4-37 will be displayed.

```
PANASONIC CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
************************EVR*********************** PAL




 13. HIGHLIGHT CHROMA CLIP
    SET "DATA (ADJUSTED) - 05h (MARGIN)"


***************************************************
<DEVICE>     : CAMERA TEMPORARY MEMORY (RAM)
<ADDRESS>    : 0AA
<DATA>       : A8 — A8

<MESSAGE>    :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY.  ROLLDOWN: PREVIOUS ITEM
   LOAD(F1)        QUIT(F3)       SAVE(F5)
```

Table 4-37

- Aim the Camera at the Logarithmic Gray Scale Chart.Adjust data with the **ARROW** keys so that the chrominance level becomes minimum as shown in Fig. 4-30, and note this data as (a).
- Re-adjust data with the **ARROW** keys so that the chrominance level becomes **b = (a) – 05h**.

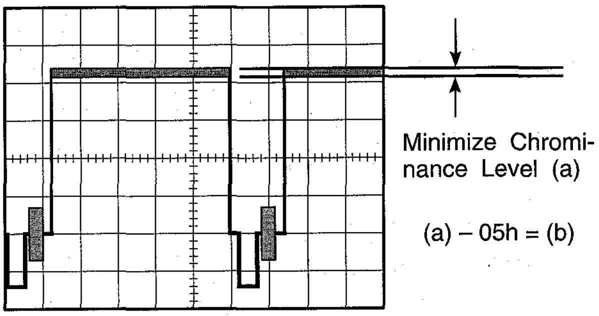


Fig. 4-30

- After completing of the adjustment, press the **QUIT (F3)** key, then the menu as shown in Table 4-38 will be displayed.

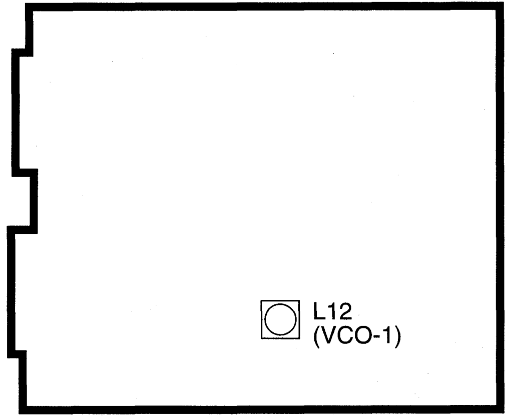
```
PANASONIC CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
************************EVR*********************** PAL




 13. HIGHLIGHT CHROMA CLIP
    SET "DATA (ADJUSTED) - 05h (MARGIN)"


***************************************************
<DEVICE>     : CAMERA TEMPORARY MEMORY (RAM)
<ADDRESS>    : 0AA
<DATA>       : A8 — A8

<MESSAGE>    :

<  SAVE CAMERA DATA TO FILE: ***.EVR  ?  Y/N  >
   LOAD(F1)        QUIT(F3)       SAVE(F5)
```

Table 4-38

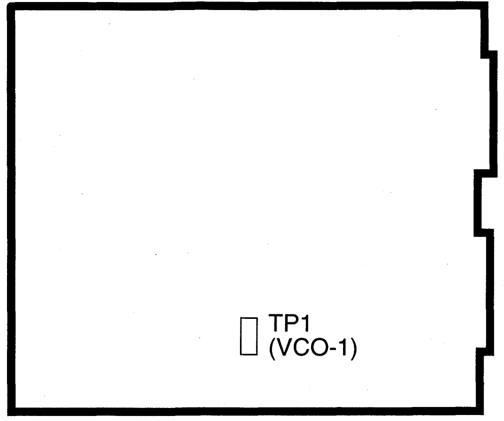
- Press the **N** key, and then press the **ENTER** key to finish of this adjustment procedure.
- Disconnect the cable from CN6 on the Digital Board.
- Set the SW50 (EVR/RC) on the Power Board is set to the RC position.

LOCATION OF TEST POINTS AND ADJUSTING CONTROLS

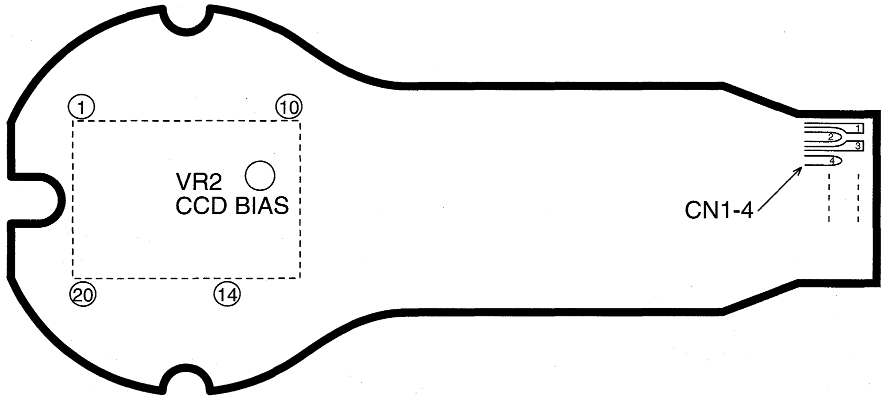
DRIVE BOARD (COMPONENT SIDE)



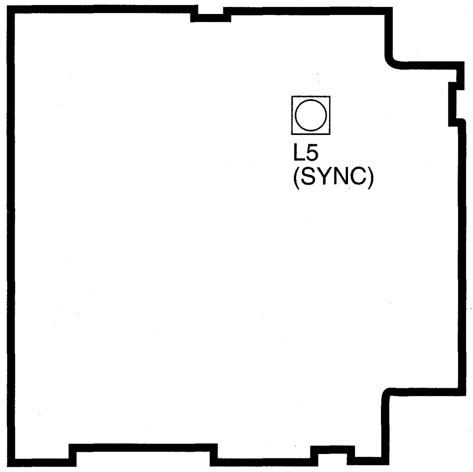
DRIVE BOARD (PATTERN SIDE)



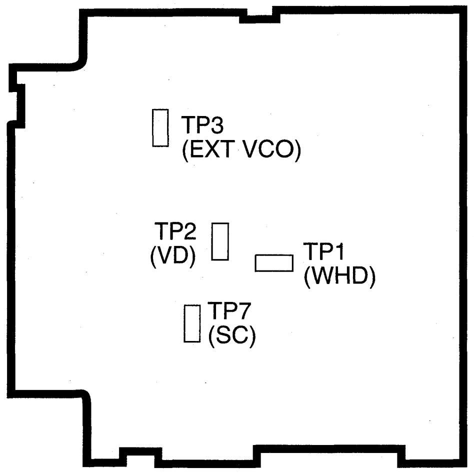
SENSOR BOARD (PATTERN SIDE)


①
⑩
VR2
CCD BIAS
CN1-4
⑳
⑭

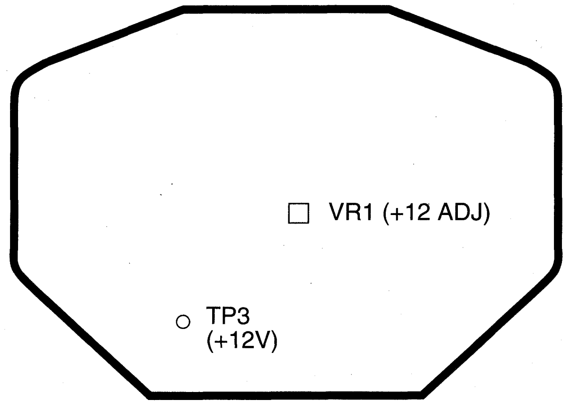
SYNC/ENCODER BOARD (COMPONENT SIDE)



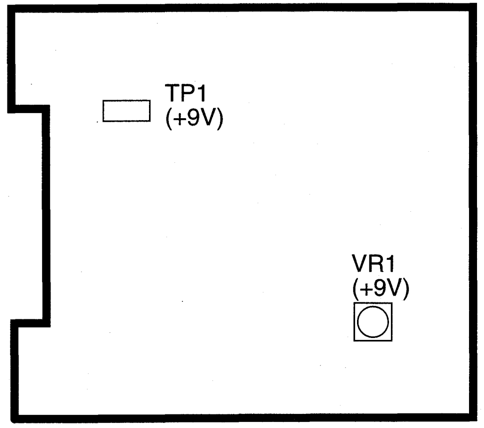
SYNC/ENCODER BOARD (PATTERN SIDE)


TP3
(EXT VCO)
TP2
(VD)
TP1
(WHD)
TP7
(SC)

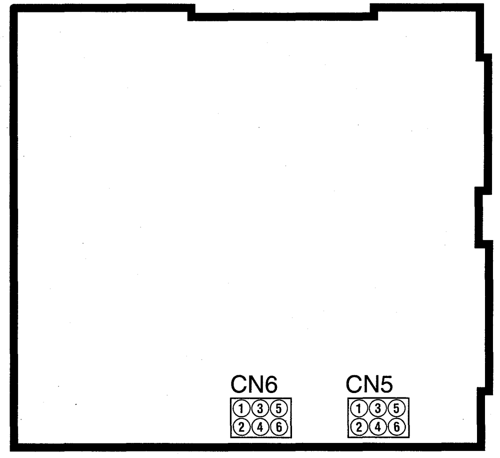
+10V/+5V REG BOARD (COMPONENT SIDE)


VR1 (+12 ADJ)
TP3
(+12V)

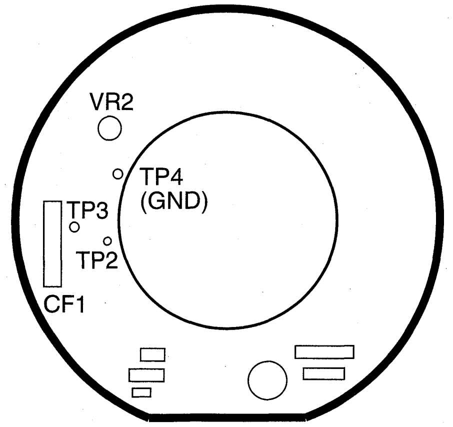
POWER BOARD (PATTERN SIDE)


TP1
(+9V)
VR1
(+9V)

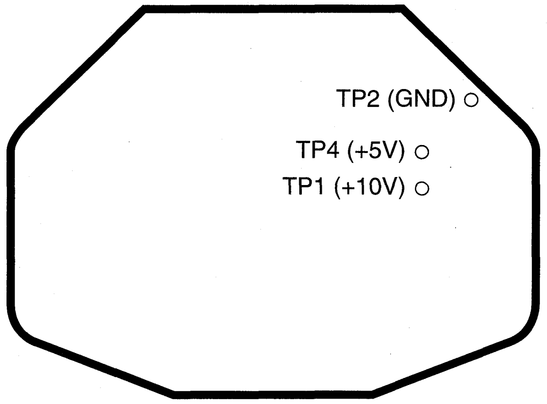
DIGITAL BOARD (COMPONENT SIDE)


CN6
CN5
①③⑤
②④⑥
①③⑤
②④⑥

RECEIVER BOARD (COMPONENT SIDE)


VR2
TP4
(GND)
TP3
TP2
CF1

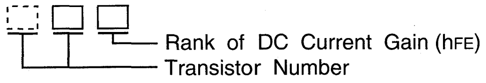
+10V REG BOARD (COMPONENT SIDE)


TP2 (GND)
TP4 (+5V)
TP1 (+10V)

CHIP COMPONENTS

1. Chip Transistor

The transistor number is indicated on the top surface of the chip transistor using two alphabet letters or one numerical number and two alphabet letters.



Transistor Number

(Chip Transistor)

Letter	Transistor No.	Letter	Transistor No.
A	2SB709	X	2SD602A
B	2SB709A	Y	2SD601
C	2SB710	Z	2SD601A
D	2SB710A	1A	2SB799
E	2SA1022	1B	2SB814
F	2SA1034	1C	2SB902
H	2SA1035	1F	2SK321
I	2SB792	1K	2SK316
K	2SC2778	1L	2SK247
P	2SD814	1M	2SJ84
Q	2SD813	1N	2SK199
R	2SC2480	1O	2SK198
S	2SC2405	1T	2SC3077
T	2SC2406	1X	2SC2845
U	2SC2404	1Z	2SD1030
V	2SC2295	2B	2SK374
W	2SD602	2C	2SK116
BQ	2SB766A	UMT	2SC4081

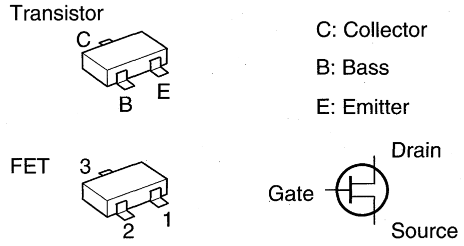
(Small Chip Transistor) (Pair Transistor)

Letter	Transistor No.
A	2SB1218
B	2SB1218A
D	2SB1219A
U	2SC3931
W	2SD1820
X	2SD1820A
Y	2SD1819
E3	2SA1226
OS	2SB1219
UC	2SA1532
YU	2SC3938

Letter	Transistor No.	Letter	Transistor No.
5R	XN1501	5H	XP4501
7S	XN1601	5C	XP4601
5H	XN4501	5H	XP4501
5C	XN4601	5L	XP5501
5L	XN5501	4N	XP5601
4N	XN5601	7S	XP6501
5N	XN6501	7W	XP6435
7W	XN6435	7F	XP6534
7F	XN6534	X1	UMX1
5R	XP1501	Z1	UMZ1
7S	XP1601		

Example: WQ → 2SD602-Q
YQ → 2SD601-Q
1BS → 2SB814-S

Appearance and Symbols

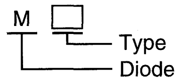


C: Collector
B: Bass
E: Emitter

	1	2	3
Eacept 2SK199	Drain	Source	Gate
2SK199	Gate	Drain	Source

2. Chip Diode

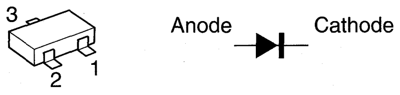
The diode number is indicated on the top surface of the chip diode using two alphabet letters.



Diode Number

	1	2	3
MA28/MA28W/MA28T	–	Anode	Cathode
MA151K/MA152K	–	Anode	Cathode
MA151A/MA152A	–	Cathode	Anode
MA151WK/MA152WK	Anode	Anode	Cathode
MA151WA/MA152WA	Cathode	Cathode	Anode
MA153	Cathode	Anode	Common
MA141K	–	Anode	Cathode
MA143	Anode	Cathode	Common
MA3062	Anode	–	Cathode
RD421D	Anode	–	Cathode

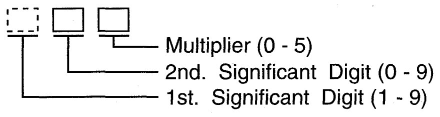
Appearance and Symbol



	1	2	3
MA28/MA28W/MA28T	–	Anode	Cathode
MA151K/MA152K	–	Anode	Cathode
MA151A/MA152A	–	Cathode	Anode
MA151WK/MA152WK	Anode	Anode	Cathode
MA151WA/MA152WA	Cathode	Cathode	Anode
MA153	Cathode	Anode	Common
MA141K	–	Anode	Cathode
MA143	Anode	Cathode	Common
MA3062	Anode	–	Cathode
RD421D	Anode	–	Cathode

3. Chip Resistor

The resistor value is indicated on the bottom surface of the chip resistor using three digit numbers.


Multiplier (0 - 5)
2nd. Significant Digit (0 - 9)
1st. Significant Digit (1 - 9)

Example:

330 → $33 \times 10^0 = 33\ \Omega$
561 → $56 \times 10^1 = 560\ \Omega$
123 → $12 \times 10^3 = 12\ \mathrm{k}\Omega$

Note: Zero ohm resistor (jumper chip) is colored red or green.

4. Chip Capacitor

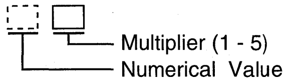
The capacitive value of replacement chip capacitors is indicated on the bottom surface. original parts do not have value indication.

If the capacitive value is less than 100 pF, the value will be indicated by one or two digit number expressing the capacity directly in pF.

Example:

0.5 → 0.5 pF 2.5 → 2.5 pF
.75 → 0.75 pF 33 → 33 pF
1 → 1 pF 82 → 82 pF

If the capacitive value is 100 pF or greater, the value will be indicated by an alpha-numeric code. The letter precedes the number and expresses a numerical value to be multiplied by the number which follows.



Numerical Value

Letter	Value	Letter	Value
A	10	N	33
B	11	P	36
C	12	Q	39
D	13	R	43
E	15	S	47
F	16	T	51
G	18	U	56
H	20	V	62
J	22	W	68
K	24	X	75
L	27	Y	82
M	30	Z	91

* Letters I and O are not used.

Example: A1 → $10 \times 10^1 = 100$ pF
N2 → $33 \times 10^2 = 3300$ pF
S3 → $47 \times 10^3 = 47000$ pF

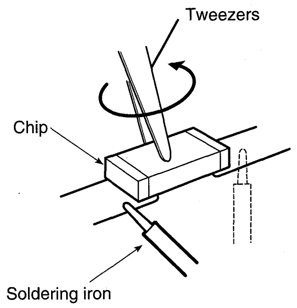
5. Precautions in replacing the chip component

1. Make sure that the unit is turned OFF when replacing the chip.
2. Use tweezers to prevent any damage to the chip surface.
3. Do not re-use the chips after removal.
4. Do not rub the electrode of chips.
5. Do not subject the chips to excessive stress.
6. It is recommended that a pencil-type soldering iron to be used.
7. The solder whose diameter is less than 0.5 mm is recommended.
8. Do not heat the chip beyond 3 second.
9. Maintain temperature control under 260°C (500°F) when soldering.

5-1. Removal (Transistor, Diode, Resistor and Capacitor)

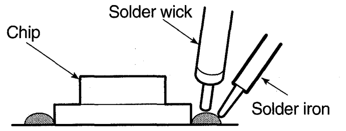
1. Add the solder to both ends of the chip (three leads for chip transistor).
2. While attaching the soldering iron to both ends of the chip (three leads for chip transistor) as shown below, remove the chip by turning with tweezers.

Note: Be careful not to damage other chips.

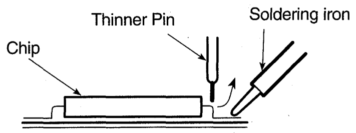


5-2. Removal (IC)

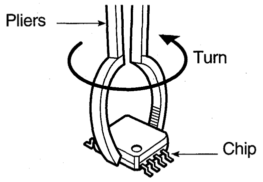
1. Add the solder wick and soldering iron to each lead of the IC and remove solder.



2. Add the soldering iron to each lead of the IC and left each lead of the IC using thinner pin.

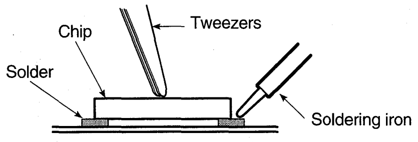


3. Remove IC turning it with pliers.

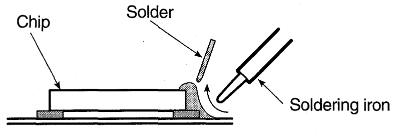


5-3. Mounting

1. Place the solder thinly on the chip mounting foil.
2. Solder the chip temporarily while holding the chip with the tweezers.



3. Solder both ends of chip (three leads for chip transistor).



APPEARANCE OF IC, TRANSISTOR AND DIODE

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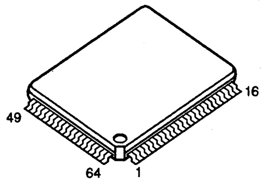

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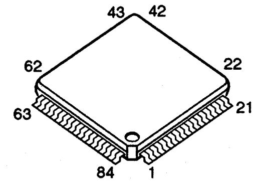
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62
22
63
21
84
1

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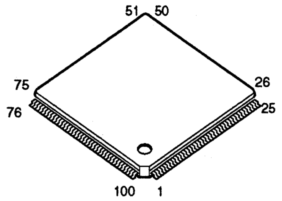
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25
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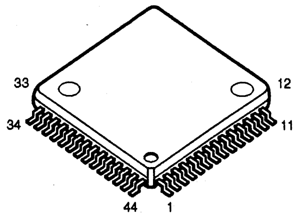
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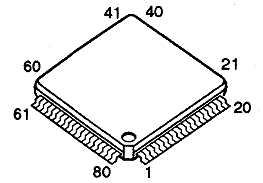
MN6730FHP
MN6731FHP
MN73093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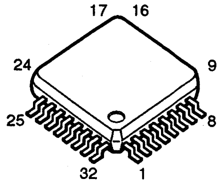
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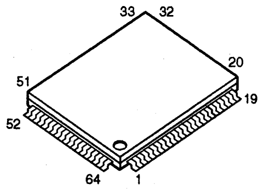
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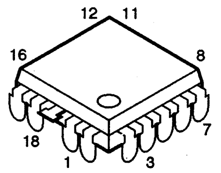
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7
1
3

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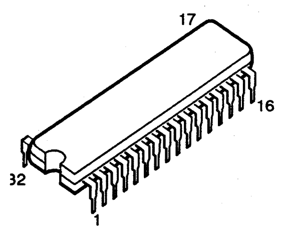

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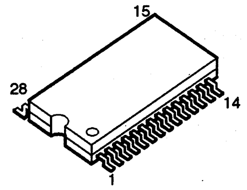

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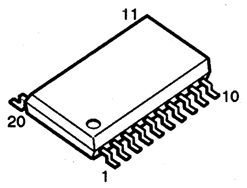
MC74HC245AF
MC74HC374AF



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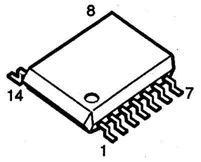
MC74HC4066F



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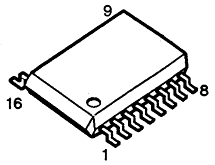

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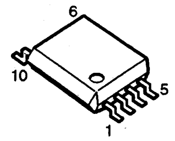

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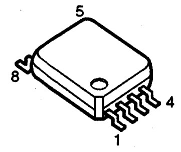
NJM3404M TL7700CSP



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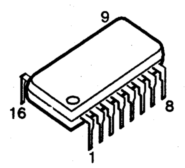

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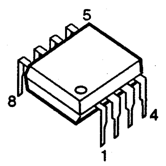

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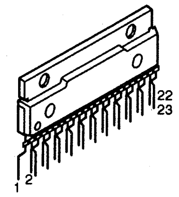

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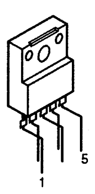

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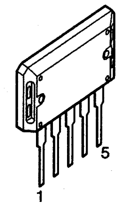

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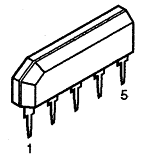

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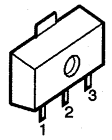
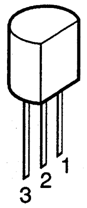


1: Input
2: Ground
3: Output

M5237L



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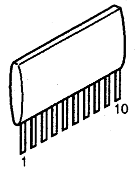

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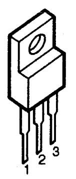

1: Input
2: Ground
3: Output

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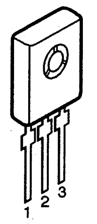

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YWTC4S66FR YWTC7S32F
YWTC4S69F YWTC7S32FL
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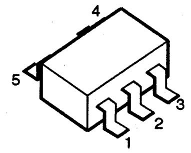

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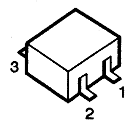

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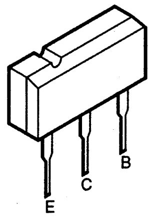

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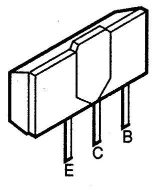
2SD874-RS



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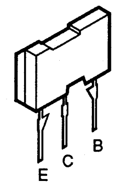
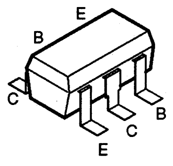


IMT1 UMX1
IMX3 UMZ1
IMZ1



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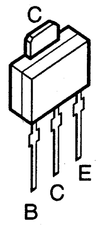

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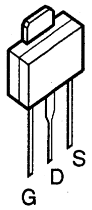

2SA1037-QRS 2SC4617
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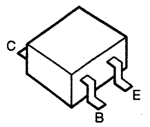

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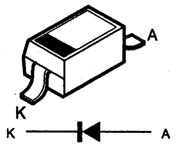
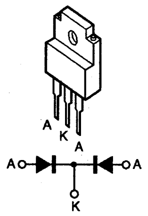


MA749



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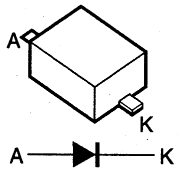
MA8033
MA8047



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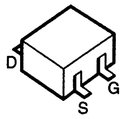

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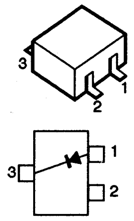

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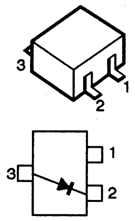

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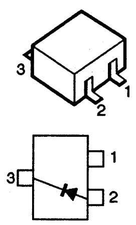

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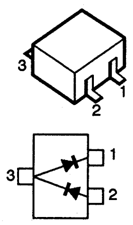
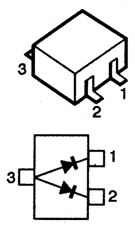
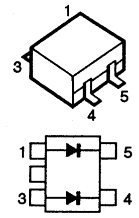


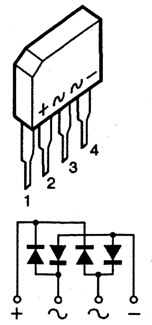
YWDA202U



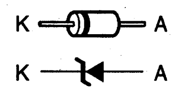
YWRB471E148



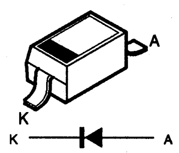
YWRBV602



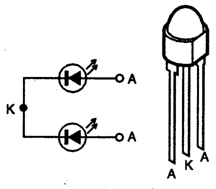
YWMTZ15B



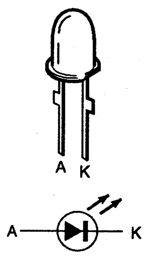
YWRB715FT106



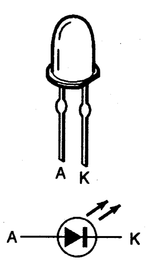
LN086WP38



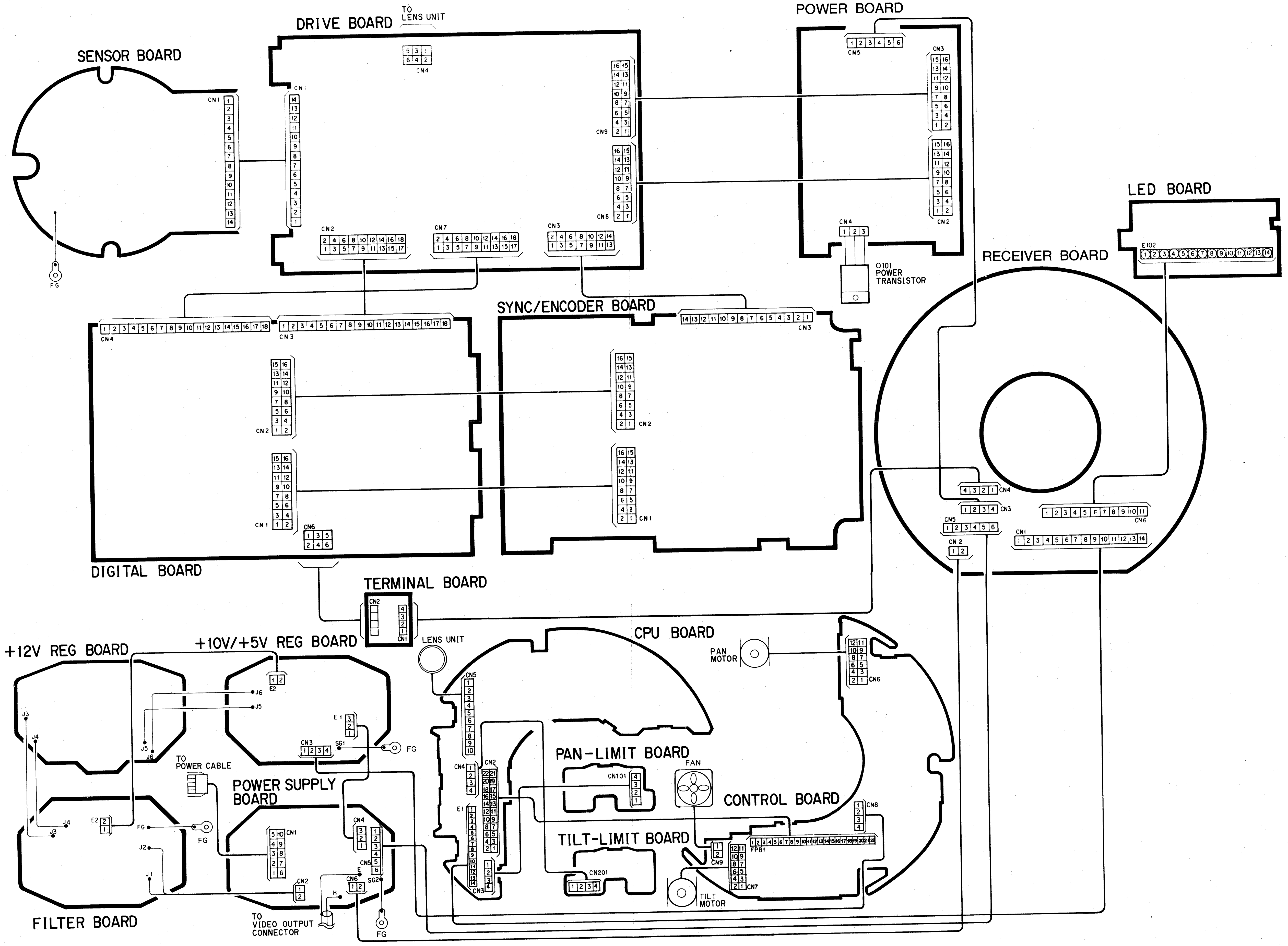
SLH38MC



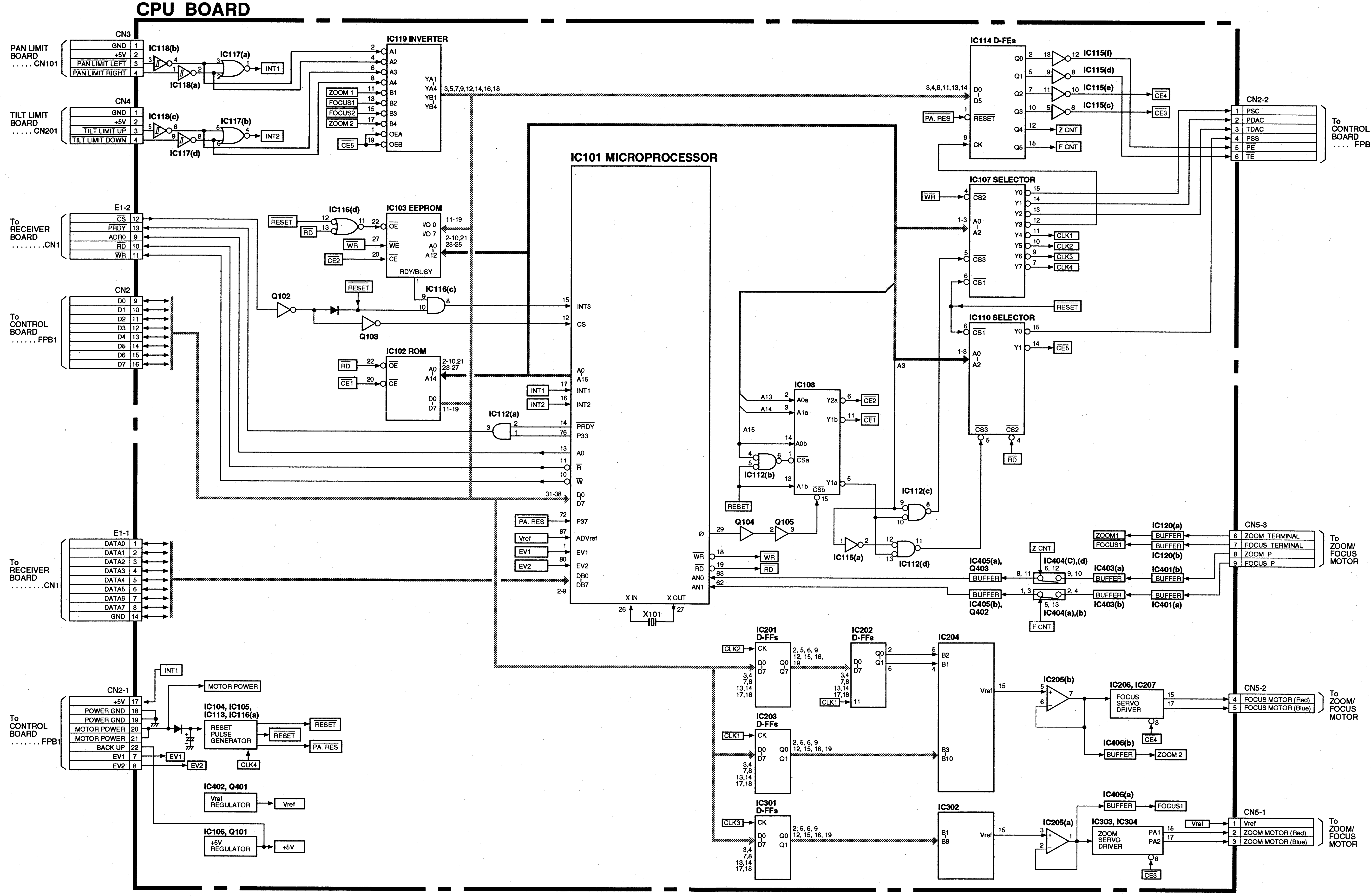
LN28RP



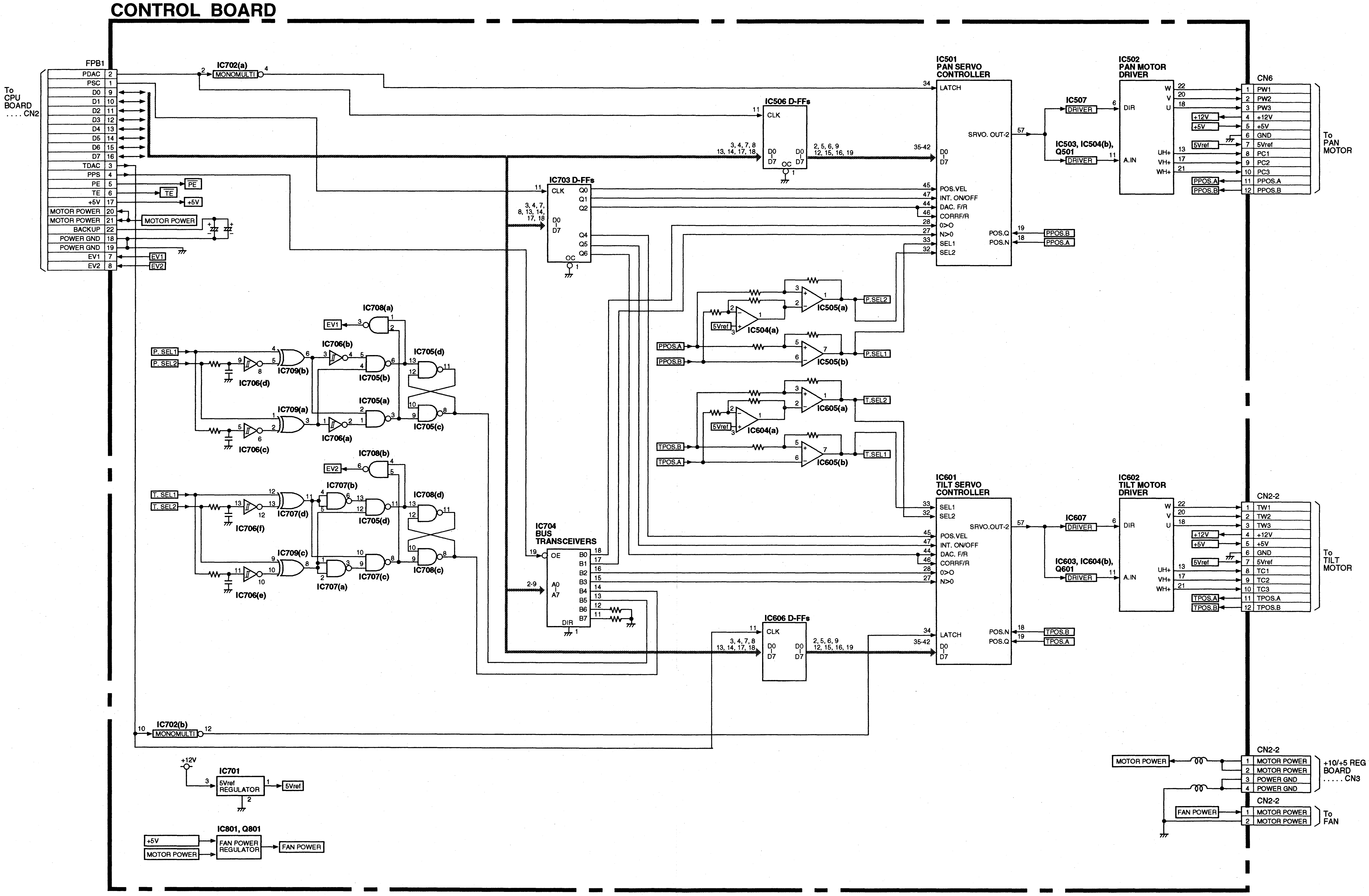
WIRING DIAGRAM


SENSOR BOARD
CN1
FG
DRIVE BOARD
TO LENS UNIT
CN1
CN2
CN3
CN4
CN7
CN8
CN9
POWER BOARD
CN2
CN3
CN4
CN5
Q101 POWER TRANSISTOR
LED BOARD
E102
RECEIVER BOARD
CN1
CN2
CN3
CN4
CN5
CN6
SYNC/ENCODER BOARD
CN1
CN2
CN3
DIGITAL BOARD
CN1
CN2
CN3
CN4
CN6
TERMINAL BOARD
CN1
CN2
LENS UNIT
CPU BOARD
CN2
CN3
CN4
CN5
CN6
E1
PAN MOTOR
PAN-LIMIT BOARD
CN101
FAN
CONTROL BOARD
CN7
CN8
CN9
FPB1
TILT-LIMIT BOARD
CN201
TILT MOTOR
+12V REG BOARD
J3
J4
+10V/+5V REG BOARD
E1
E2
J5
J6
CN3
SG1
FG
TO POWER CABLE
POWER SUPPLY BOARD
CN1
CN2
CN4
CN5
CN6
SG2
E
H
FG
FILTER BOARD
E2
J1
J2
J3
J4
FG
TO VIDEO OUTPUT CONNECTOR

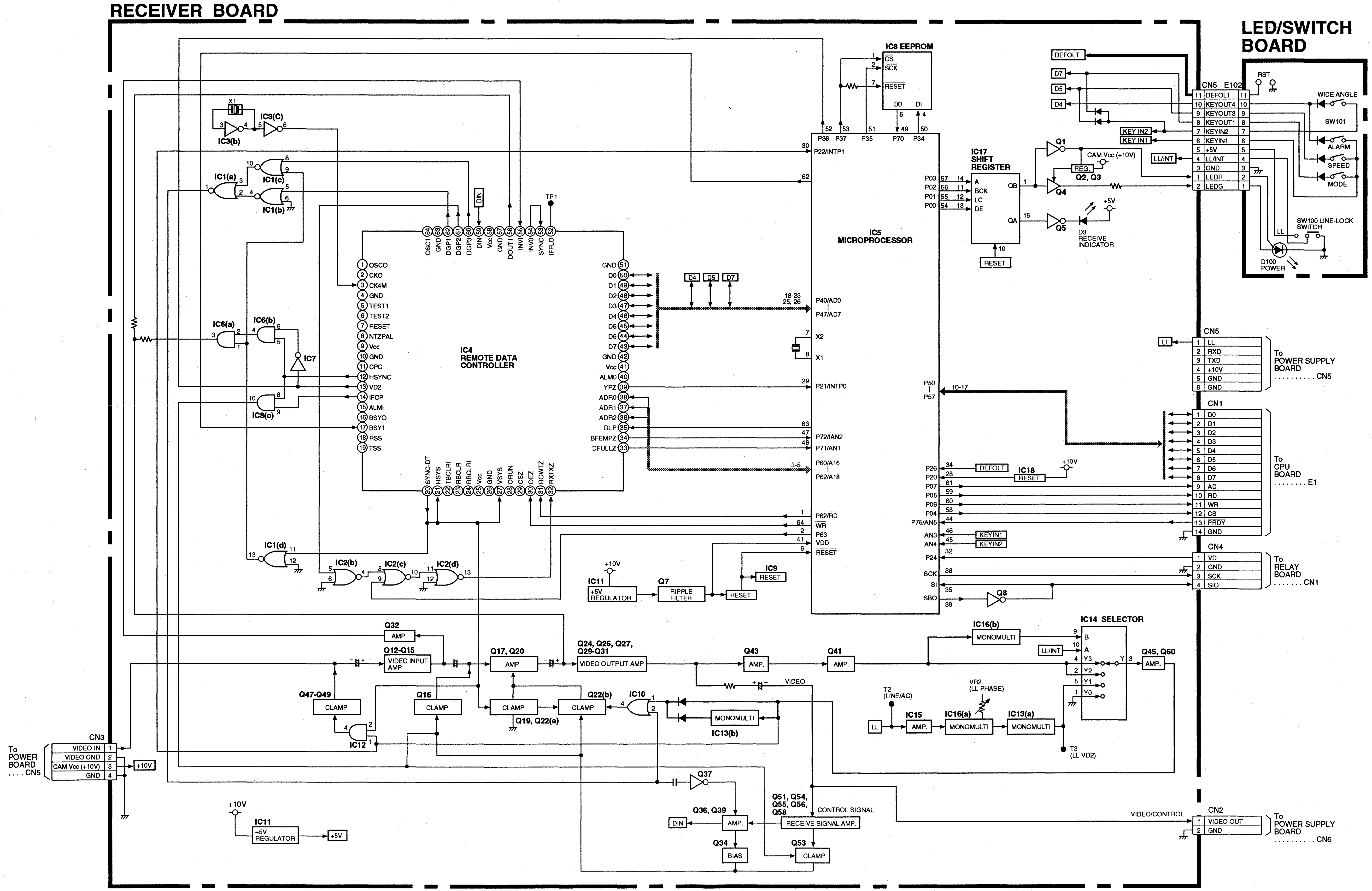
BLOCK DIAGRAM OF CPU BOARD


CPU BOARD
PAN LIMIT BOARD CN101
CN3
GND 1
+5V 2
PAN LIMIT LEFT 3
PAN LIMIT RIGHT 4
TILT LIMIT BOARD CN201
CN4
GND 1
+5V 2
TILT LIMIT UP 3
TILT LIMIT DOWN 4
IC118(b)
IC118(a)
IC118(c)
IC117(a)
IC117(b)
IC117(d)
INT1
INT2
IC119 INVERTER
A1
A2
A3
A4
B1
B2
B3
B4
OEA
OEB
YA1 - YA4
YB1 - YB4
ZOOM 1
FOCUS1
FOCUS2
ZOOM 2
CE5
3,5,7,9,12,14,16,18
To RECEIVER BOARD CN1
E1-2
CS 12
PRDY 13
ADR0 9
RD 10
WR 11
IC116(d)
RESET
RD
IC103 EEPROM
OE
WE
CE
I/O 0 - I/O 7
A0 - A12
RDY/BUSY
11-19
2-10,21 23-25
WR
CE2
Q102
Q103
IC116(c)
To CONTROL BOARD FPB1
CN2
D0 9
D1 10
D2 11
D3 12
D4 13
D5 14
D6 15
D7 16
IC102 ROM
OE
CE
A0 - A14
D0 - D7
2-10,21 23-27
11-19
CE1
IC112(a)
IC101 MICROPROCESSOR
INT3
CS
A0 - A15
INT1
INT2
PRDY
P33
A0
R
W
D0 - D7
P37
ADVref
EV1
EV2
DB0 - DB7
WR
RD
AN0
AN1
X IN
X OUT
X101
31-38
PA. RES
Vref
EV1
EV2
To RECEIVER BOARD CN1
E1-1
DATA0 1
DATA1 2
DATA2 3
DATA3 4
DATA4 5
DATA5 6
DATA6 7
DATA7 8
GND 14
To CONTROL BOARD FPB1
CN2-1
+5V 17
POWER GND 18
POWER GND 19
MOTOR POWER 20
MOTOR POWER 21
BACK UP 22
EV1 7
EV2 8
INT1
MOTOR POWER
IC104, IC105, IC113, IC116(a)
RESET PULSE GENERATOR
RESET
PA. RES
CLK4
IC402, Q401
Vref REGULATOR
Vref
IC106, Q101
+5V REGULATOR
+5V
IC114 D-FEs
D0 - D5
RESET
CK
Q0
Q1
Q2
Q3
Q4
Q5
3,4,6,11,13,14
IC115(f)
IC115(d)
IC115(e)
IC115(c)
CE4
CE3
Z CNT
F CNT
CN2-2
1 PSC
2 PDAC
3 TDAC
4 PSS
5 PE
6 TE
To CONTROL BOARD FPB1
IC107 SELECTOR
CS2
A0 - A2
CS3
CS1
Y0
Y1
Y2
Y3
Y4
Y5
Y6
Y7
CLK1
CLK2
CLK3
CLK4
IC110 SELECTOR
CS1
A0 - A2
Y0
Y1
CE5
CS3
CS2
A3
IC108
A13
A14
A15
A0a
A1a
A0b
CSa
A1b
CSb
Y2a
Y1b
Y1a
CE2
CE1
IC112(b)
IC112(c)
IC112(d)
IC115(a)
Q104
Q105
CN5-3
6 ZOOM TERMINAL
7 FOCUS TERMINAL
8 ZOOM P
9 FOCUS P
To ZOOM/ FOCUS MOTOR
IC120(a)
IC120(b)
BUFFER
ZOOM1
FOCUS1
IC404(C),(d)
IC404(a),(b)
IC405(a), Q403
IC405(b), Q402
IC403(a)
IC403(b)
IC401(b)
IC401(a)
Z CNT
F CNT
IC201 D-FFs
IC202 D-FFs
IC203 D-FFs
IC301 D-FFs
CK
D0 - D7
Q0 - Q7
Q0 - Q1
2, 5, 6, 9 12, 15, 16, 19
3,4 7,8 13,14 17,18
CLK2
CLK1
CLK3
IC204
B2
B1
B3 - B10
Vref
IC205(b)
IC206, IC207
FOCUS SERVO DRIVER
CE4
IC406(b)
ZOOM 2
CN5-2
4 FOCUS MOTOR (Red)
5 FOCUS MOTOR (Blue)
To ZOOM/ FOCUS MOTOR
IC302
B1 - B8
Vref
IC205(a)
IC303, IC304
ZOOM SERVO DRIVER
PA1
PA2
CE3
IC406(a)
FOCUS1
CN5-1
1 Vref
2 ZOOM MOTOR (Red)
3 ZOOM MOTOR (Blue)
To ZOOM/ FOCUS MOTOR

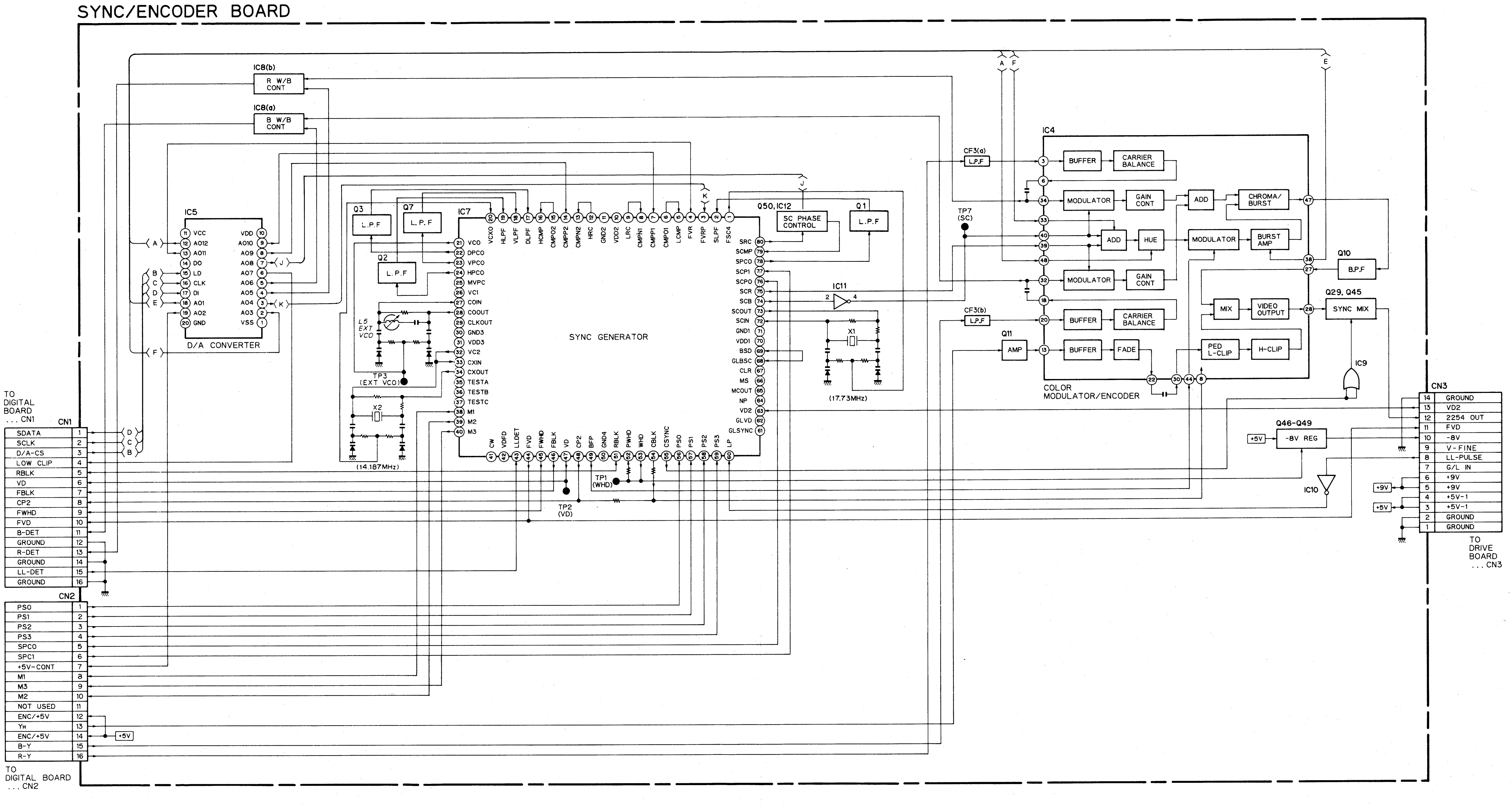
BLOCK DIAGRAM OF CONTROL BOARD


CONTROL BOARD
To CPU BOARD CN2
FPB1
PDAC 2
PSC 1
D0 9
D1 10
D2 11
D3 12
D4 13
D5 14
D6 15
D7 16
TDAC 3
PPS 4
PE 5
TE 6
+5V 17
MOTOR POWER 20
MOTOR POWER 21
BACKUP 22
POWER GND 18
POWER GND 19
EV1 7
EV2 8
PE
TE
+5V
MOTOR POWER
EV1
EV2
IC702(a)
MONOMULTI
IC506 D-FFs
CLK
D0 D7
OC
IC703 D-FFs
CLK
Q0 Q1 Q2 Q4 Q5 Q6
D0 D7
OC
IC501
PAN SERVO CONTROLLER
LATCH
D0 D7
SRVO. OUT-2
POS.VEL
INT. ON/OFF
DAC. F/R
CORRF/R
0>O
N>0
SEL1
SEL2
POS.Q
POS.N
PPOS.B
PPOS.A
IC507
DRIVER
IC503, IC504(b), Q501
DRIVER
IC502
PAN MOTOR DRIVER
DIR
A.IN
W V U
UH+ VH+ WH+
CN6
1 PW1
2 PW2
3 PW3
4 +12V
5 +5V
6 GND
7 5Vref
8 PC1
9 PC2
10 PC3
11 PPOS.A
12 PPOS.B
+12V
+5V
5Vref
PPOS.A
PPOS.B
To PAN MOTOR
IC708(a)
IC706(b)
IC705(d)
P. SEL1
P. SEL2
IC709(b)
IC705(b)
IC706(d)
IC705(a)
IC709(a)
IC705(c)
IC706(a)
IC706(c)
IC505(a)
IC504(a)
5Vref
P.SEL2
PPOS.A
PPOS.B
IC505(b)
P.SEL1
IC605(a)
IC604(a)
5Vref
T.SEL2
TPOS.B
TPOS.A
IC605(b)
T.SEL1
IC708(b)
EV2
IC707(b)
IC708(d)
T. SEL1
T. SEL2
IC707(d)
IC705(d)
IC706(f)
IC709(c)
IC707(c)
IC708(c)
IC706(e)
IC707(a)
IC704
BUS TRANSCEIVERS
OE
A0 A7
B0 B1 B2 B3 B4 B5 B6 B7
DIR
IC601
TILT SERVO CONTROLLER
SEL1
SEL2
SRVO.OUT-2
POS.VEL
INT. ON/OFF
DAC. F/R
CORRF/R
0>O
N>0
LATCH
D0 D7
POS.N
POS.Q
TPOS.B
TPOS.A
IC607
DRIVER
IC603, IC604(b), Q601
DRIVER
IC602
TILT MOTOR DRIVER
DIR
A.IN
W V U
UH+ VH+ WH+
CN2-2
1 TW1
2 TW2
3 TW3
4 +12V
5 +5V
6 GND
7 5Vref
8 TC1
9 TC2
10 TC3
11 TPOS.A
12 TPOS.B
+12V
+5V
5Vref
TPOS.A
TPOS.B
To TILT MOTOR
IC606 D-FFs
CLK
D0 D7
IC702(b)
MONOMULTI
+12V
IC701
5Vref REGULATOR
5Vref
IC801, Q801
+5V
MOTOR POWER
FAN POWER REGULATOR
FAN POWER
MOTOR POWER
CN2-2
1 MOTOR POWER
2 MOTOR POWER
3 POWER GND
4 POWER GND
+10/+5 REG BOARD CN3
FAN POWER
CN2-2
1 MOTOR POWER
2 MOTOR POWER
To FAN

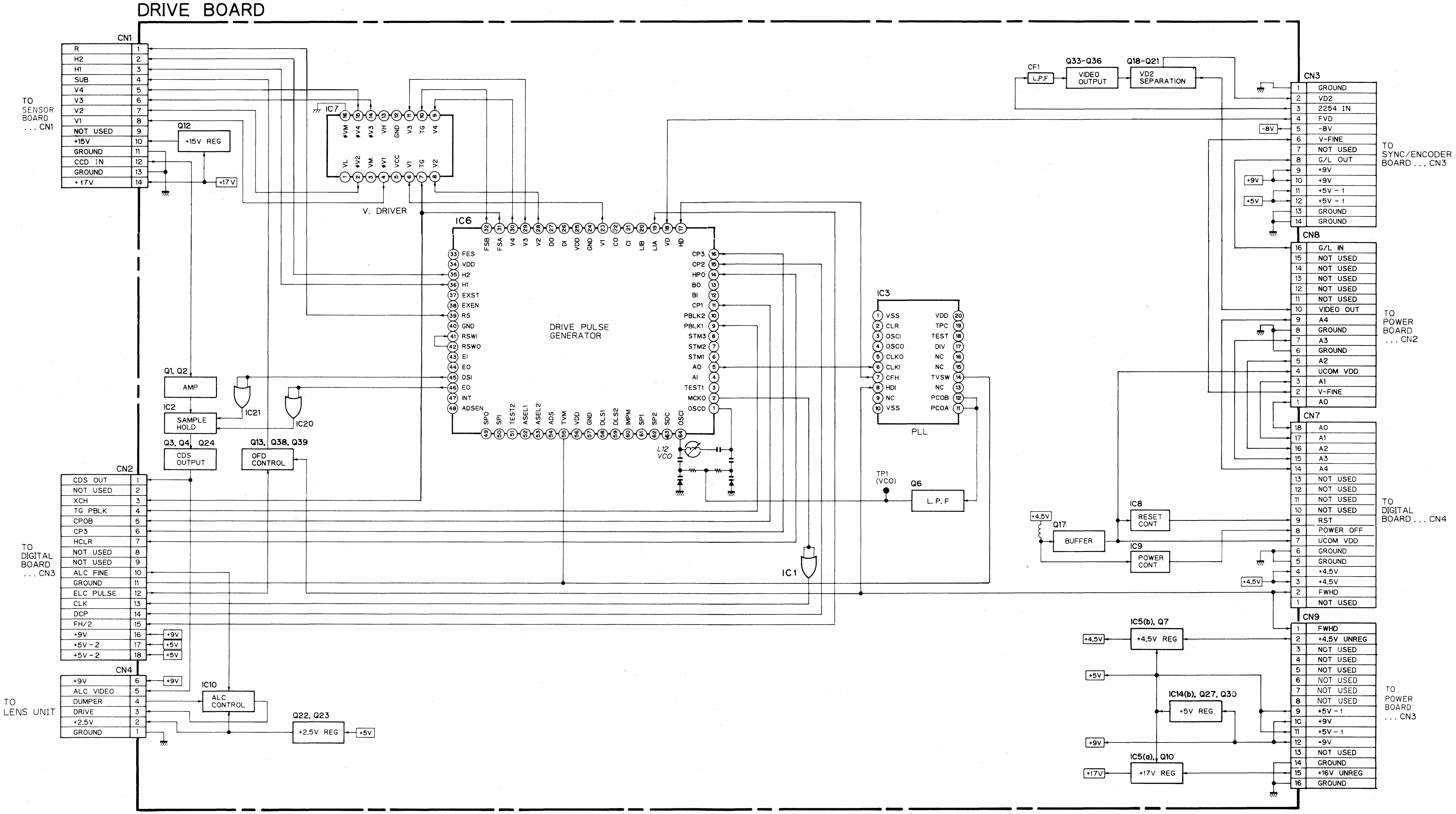
BLOCK DIAGRAM OF RECEIVER BOARD


RECEIVER BOARD
LED/SWITCH BOARD
IC8 EEPROM
CS
SCK
RESET
DO
DI
X1
IC3(C)
IC3(b)
IC1(a)
IC1(c)
IC1(b)
DIN
TP1
OSC1
GND
DGP1
DGP2
DGP3
DIN
Vcc
GND
DOUT1
INVI
INVO
SYNC
IFFLD
OSCO
CKO
CK4M
GND
TEST1
TEST2
RESET
NTZPAL
Vcc
GND
CPC
HSYNC
VD2
IFCP
ALMI
BSYO
BSY1
RSS
TSS
IC4
REMOTE DATA
CONTROLLER
GND
D0
D1
D2
D3
D4
D5
D6
D7
GND
Vcc
ALM0
YPZ
ADR0
ADR1
ADR2
DLP
BFEMPZ
DFULLZ
SYNC-DT
HSYS
TBCLRI
RBCLR
RBCLRI
Vcc
GND
VSYS
ORUN
CSZ
OEZ
ROWTZ
RXTXZ
IC6(a)
IC6(b)
IC7
IC8(c)
IC1(d)
IC2(b)
IC2(c)
IC2(d)
D4
D5
D7
IC5
MICROPROCESSOR
P36
P37
P35
P70
P34
P22/INTP1
P03
P02
P01
P00
P40/AD0
P47/AD7
X2
X1
P21/INTP0
P50
P57
P72/IAN2
P71/AN1
P60/A16
P62/A18
P62/RD
WR
P63
VDD
RESET
P26
P20
P07
P05
P06
P04
P75/AN5
AN3
AN4
P24
SCK
SI
SBO
IC17
SHIFT
REGISTER
A
BCK
LC
DE
QB
QA
RESET
Q1
CAM Vcc (+10V)
REG.
Q2, Q3
Q4
Q5
+5V
D3
RECEIVE
INDICATOR
DEFOLT
D7
D5
D4
KEY IN2
KEY IN1
LL/INT
CN5
E102
DEFOLT
KEYOUT4
KEYOUT3
KEYOUT1
KEYIN2
KEYIN1
+5V
LL/INT
GND
LEDR
LEDG
RST
WIDE ANGLE
SW101
ALARM
SPEED
MODE
SW100 LINE-LOCK
SWITCH
LL
D100
POWER
CN5
LL
RXD
TXD
+10V
GND
GND
To
POWER SUPPLY
BOARD
..........CN5
CN1
D0
D1
D2
D3
D4
D5
D6
D7
AD
RD
WR
CS
PRDY
GND
To
CPU
BOARD
........E1
CN4
VD
GND
SCK
SIO
To
RELAY
BOARD
.......CN1
DEFOLT
IC18
RESET
+10V
KEYIN1
KEYIN2
Q8
IC11
+5V
REGULATOR
Q7
RIPPLE
FILTER
RESET
IC9
RESET
Q32
AMP.
Q12-Q15
VIDEO INPUT
AMP
Q17, Q20
AMP
Q24, Q26, Q27,
Q29-Q31
VIDEO OUTPUT AMP
Q43
AMP.
Q41
AMP.
IC16(b)
MONOMULTI
IC14 SELECTOR
B
A
Y3
Y2
Y1
Y0
Y
LL/INT
Q45, Q60
AMP.
VIDEO
Q47-Q49
CLAMP
Q16
CLAMP
CLAMP
Q19, Q22(a)
Q22(b)
CLAMP
IC10
MONOMULTI
IC13(b)
IC12
T2
(LINE/AC)
VR2
(LL PHASE)
IC15
AMP.
IC16(a)
MONOMULTI
IC13(a)
MONOMULTI
LL
T3
(LL VD2)
To
POWER
BOARD
....CN5
CN3
VIDEO IN
VIDEO GND
CAM Vcc (+10V)
GND
+10V
Q37
Q36, Q39
AMP.
DIN
Q34
BIAS
Q51, Q54,
Q55, Q56,
Q58
RECEIVE SIGNAL AMP.
CONTROL SIGNAL
Q53
CLAMP
+10V
IC11
+5V
REGULATOR
+5V
VIDEO/CONTROL
CN2
VIDEO OUT
GND
To
POWER SUPPLY
BOARD
..........CN6

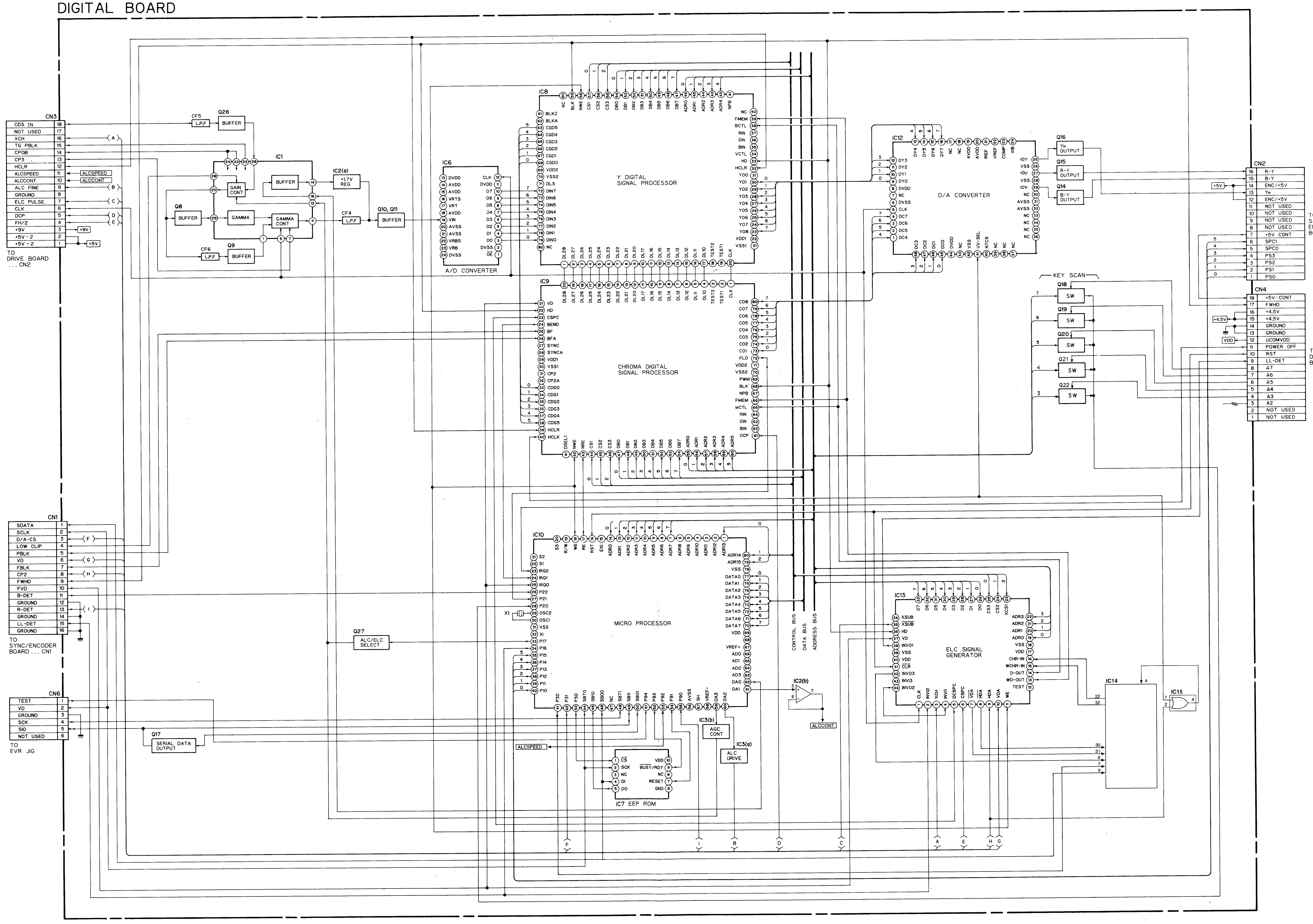
BLOCK DIAGRAM OF SYNC/ENCODER BOARD


SYNC/ENCODER BOARD
IC8(b)
R W/B CONT
IC8(a)
B W/B CONT
IC5
D/A CONVERTER
VCC
AO12
AO11
DO
LD
CLK
DI
AO1
AO2
GND
VDD
AO10
AO9
AO8
AO7
AO6
AO5
AO4
AO3
VSS
Q3
L.P.F
Q7
L.P.F
Q2
L.P.F
IC7
SYNC GENERATOR
VCO
DPCO
VPCO
HPCO
MVPC
VC1
COIN
COOUT
CLKOUT
GND3
VDD3
VC2
CXIN
CXOUT
TESTA
TESTB
TESTC
M1
M2
M3
VCXO
HLPF
VLPF
DLPF
HCMP
CMPO2
CMPP2
CMPN2
HRC
GND2
VDD2
LRC
CMPN1
CMPP1
CMPO1
LCMP
FVR
FVRP
SLPF
FSC4
SRC
SCMP
SPCO
SCP1
SCPO
SCR
SCB
SCOUT
SCIN
GND1
VDD1
BSD
GLBSC
CLR
MS
MCOUT
NP
VD2
GLVD
GLSYNC
CW
VDFD
LLDET
FVD
FWHD
FBLK
VD
CP2
BFP
GND4
RBLK
PWHD
WHD
CBLK
CSYNC
PS0
PS1
PS2
PS3
LP
L5
EXT VCO
TP3
(EXT VCO)
X2
(14.187MHz)
TP1
(WHD)
TP2
(VD)
Q50, IC12
SC PHASE CONTROL
Q1
L.P.F
IC11
X1
(17.73MHz)
TP7
(SC)
CF3(a)
L.P.F
CF3(b)
L.P.F
Q11
AMP
IC4
BUFFER
CARRIER BALANCE
MODULATOR
GAIN CONT
ADD
CHROMA/ BURST
ADD
HUE
MODULATOR
BURST AMP
MODULATOR
GAIN CONT
BUFFER
CARRIER BALANCE
MIX
VIDEO OUTPUT
BUFFER
FADE
PED L-CLIP
H-CLIP
COLOR MODULATOR/ENCODER
Q10
B.P.F
Q29, Q45
SYNC MIX
IC9
Q46-Q49
+5V
-8V REG
IC10
+9V
+5V
A
B
C
D
E
F
J
K
TO DIGITAL BOARD ...CN1
CN1
1 SDATA
2 SCLK
3 D/A-CS
4 LOW CLIP
5 RBLK
6 VD
7 FBLK
8 CP2
9 FWHD
10 FVD
11 B-DET
12 GROUND
13 R-DET
14 GROUND
15 LL-DET
16 GROUND
CN2
1 PS0
2 PS1
3 PS2
4 PS3
5 SPCO
6 SPC1
7 +5V-CONT
8 M1
9 M3
10 M2
11 NOT USED
12 ENC/+5V
13 YH
14 ENC/+5V
15 B-Y
16 R-Y
+5V
TO DIGITAL BOARD ...CN2
CN3
14 GROUND
13 VD2
12 2254 OUT
11 FVD
10 -8V
9 V-FINE
8 LL-PULSE
7 G/L IN
6 +9V
5 +9V
4 +5V-1
3 +5V-1
2 GROUND
1 GROUND
TO DRIVE BOARD ...CN3

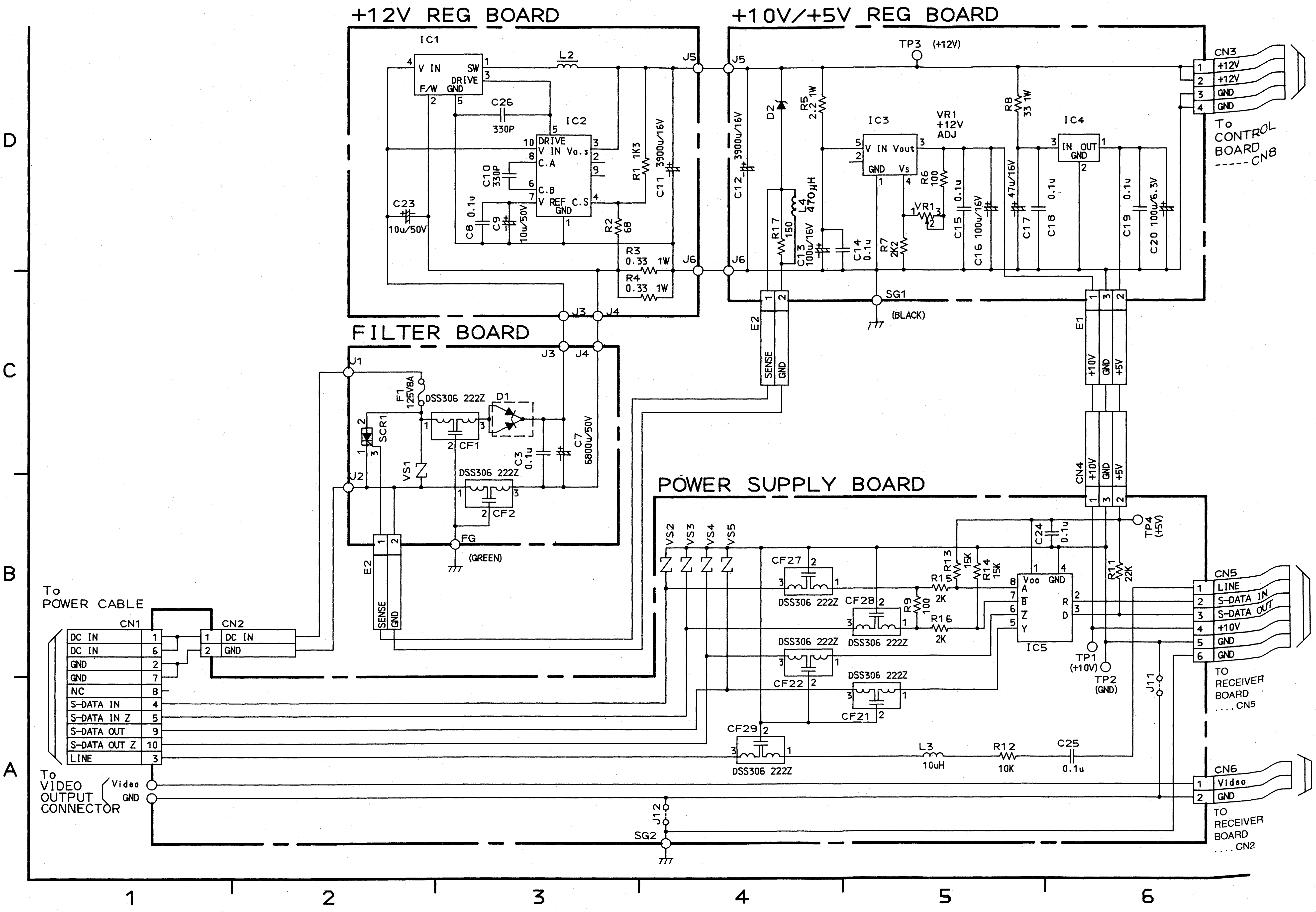
BLOCK DIAGRAM OF DRIVE BOARD


DRIVE BOARD
CN1
1 R
2 H2
3 H1
4 SUB
5 V4
6 V3
7 V2
8 V1
9 NOT USED
10 +15V
11 GROUND
12 CCD IN
13 GROUND
14 +17V
TO SENSOR BOARD ... CN1
Q12
+15V REG
+17V
IC7
16 ϕVM
15 ϕV4
14 ϕV3
13 VH
12 GND
11 V3
10 TG
9 V4
1 VL
2 ϕV2
3 VM
4 ϕV1
5 VCC
6 V1
7 TG
8 V2
V. DRIVER
IC6
32 FSB
31 FSA
30 V4
29 V3
28 V2
27 DO
26 DI
25 VDD
24 GND
23 V1
22 CO
21 CI
20 LIB
19 LIA
18 VD
17 HD
33 FES
34 VDD
35 H2
36 H1
37 EXST
38 EXEN
39 RS
40 GND
41 RSWI
42 RSWO
43 EI
44 EO
45 DSI
46 EO
47 INT
48 ADSEN
16 CP3
15 CP2
14 HPO
13 BO
12 BI
11 CP1
10 PBLK2
9 PBLK1
8 STM3
7 STM2
6 STM1
5 AO
4 AI
3 TEST1
2 MCKO
1 OSCO
DRIVE PULSE GENERATOR
49 SPO
50 SPI
51 TEST2
52 ASEL1
53 ASEL2
54 ADS
55 TVM
56 VDD
57 GND
58 DLS1
59 DLS2
60 IMPM
61 SP1
62 SP2
63 SDC
64 OSCI
L12 VCO
Q1, Q2
AMP
IC21
IC2
SAMPLE HOLD
IC20
Q3, Q4, Q24
CDS OUTPUT
Q13, Q38, Q39
OFD CONTROL
IC3
1 VSS
2 CLR
3 OSCI
4 OSCO
5 CLKO
6 CLKI
7 CFH
8 HDI
9 NC
10 VSS
20 VDD
19 TPC
18 TEST
17 DIV
16 NC
15 NC
14 TVSW
13 NC
12 PCOB
11 PCOA
PLL
TP1 (VCO)
Q6
L. P. F
IC1
CN2
1 CDS OUT
2 NOT USED
3 XCH
4 TG PBLK
5 CPOB
6 CP3
7 HCLR
8 NOT USED
9 NOT USED
10 ALC FINE
11 GROUND
12 ELC PULSE
13 CLK
14 DCP
15 FH/2
16 +9V
17 +5V - 2
18 +5V - 2
+9V
+5V
+5V
TO DIGITAL BOARD ... CN3
CN4
6 +9V
5 ALC VIDEO
4 DUMPER
3 DRIVE
2 +2.5V
1 GROUND
+9V
TO LENS UNIT
IC10
ALC CONTROL
Q22, Q23
+2.5V REG
+5V
CF1
L.P.F
Q33-Q36
VIDEO OUTPUT
Q18-Q21
VD2 SEPARATION
CN3
1 GROUND
2 VD2
3 2254 IN
4 FVD
5 -8V
6 V-FINE
7 NOT USED
8 G/L OUT
9 +9V
10 +9V
11 +5V - 1
12 +5V - 1
13 GROUND
14 GROUND
-8V
+9V
+5V
TO SYNC/ENCODER BOARD ... CN3
CN8
16 G/L IN
15 NOT USED
14 NOT USED
13 NOT USED
12 NOT USED
11 NOT USED
10 VIDEO OUT
9 A4
8 GROUND
7 A3
6 GROUND
5 A2
4 UCOM VDD
3 A1
2 V-FINE
1 AO
TO POWER BOARD ... CN2
CN7
18 AO
17 A1
16 A2
15 A3
14 A4
13 NOT USED
12 NOT USED
11 NOT USED
10 NOT USED
9 RST
8 POWER OFF
7 UCOM VDD
6 GROUND
5 GROUND
4 +4.5V
3 +4.5V
2 FWHD
1 NOT USED
TO DIGITAL BOARD ... CN4
IC8
RESET CONT
IC9
POWER CONT
+4.5V
Q17
BUFFER
+4.5V
CN9
1 FWHD
2 +4.5V UNREG
3 NOT USED
4 NOT USED
5 NOT USED
6 NOT USED
7 NOT USED
8 NOT USED
9 +5V - 1
10 +9V
11 +5V - 1
12 +9V
13 NOT USED
14 GROUND
15 +16V UNREG
16 GROUND
TO POWER BOARD ... CN3
IC5(b), Q7
+4.5V REG
+4.5V
+5V
IC14(b), Q27, Q30
+5V REG
+9V
IC5(a), Q10
+17V REG
+17V

BLOCK DIAGRAM OF DIGITAL BOARD


DIGITAL BOARD
CN3
CDS IN 18
NOT USED 17
XCH 16
TG PBLK 15
CPOB 14
CP3 13
HCLR 12
ALCSPEED 11
ALCCONT 10
ALC FINE 9
GROUND 8
ELC PULSE 7
CLK 6
DCP 5
FH/2 4
+9V 3
+5V-2 2
+5V-2 1
TO DRIVE BOARD ... CN2
CF5 LPF
Q26 BUFFER
IC1
GAIN CONT
BUFFER
GAMMA
GAMMA CONT
Q8 BUFFER
CF6 LPF
Q9 BUFFER
IC2(a) +1.7V REG
CF4 LPF
Q10, Q11 BUFFER
IC6
A/D CONVERTER
IC8
Y DIGITAL SIGNAL PROCESSOR
IC9
CHROMA DIGITAL SIGNAL PROCESSOR
IC12
D/A CONVERTER
Q16 YH OUTPUT
Q15 R-Y OUTPUT
Q14 B-Y OUTPUT
CN2
R-Y 16
B-Y 15
ENC/+5V 14
YH 13
ENC/+5V 12
NOT USED 11
NOT USED 10
NOT USED 9
NOT USED 8
+5V CONT 7
SPC1 6
SPC0 5
PS3 4
PS2 3
PS1 2
PS0 1
TO SYNC/ENCODER BOARD ... CN2
KEY SCAN
Q18 SW
Q19 SW
Q20 SW
Q21 SW
Q22 SW
CN4
+5V-CONT 18
FWHD 17
+4.5V 16
+4.5V 15
GROUND 14
GROUND 13
UCOMVDD 12
POWER OFF 11
RST 10
LL-DET 9
A7 8
A6 7
A5 6
A4 5
A3 4
A2 3
NOT USED 2
NOT USED 1
TO DRIVE BOARD ... CN7
CN1
SDATA 1
SCLK 2
D/A-CS 3
LOW CLIP 4
PBLK 5
VD 6
FBLK 7
CP2 8
FWHD 9
FVD 10
B-DET 11
GROUND 12
R-DET 13
GROUND 14
LL-DET 15
GROUND 16
TO SYNC/ENCODER BOARD ... CN1
IC10
MICRO PROCESSOR
X1
Q27 ALC/ELC SELECT
CONTROL BUS
DATA BUS
ADDRESS BUS
IC2(b)
ALCCONT
IC3(b) AGC CONT
IC3(a) ALC DRIVE
ALCSPEED
IC7 EEP ROM
IC13
ELC SIGNAL GENERATOR
IC14
IC15
CN6
TEST 1
VD 2
GROUND 3
SCK 4
SIO 5
NOT USED 6
TO EVR JIG
Q17 SERIAL DATA OUTPUT
A B C D E F G H I

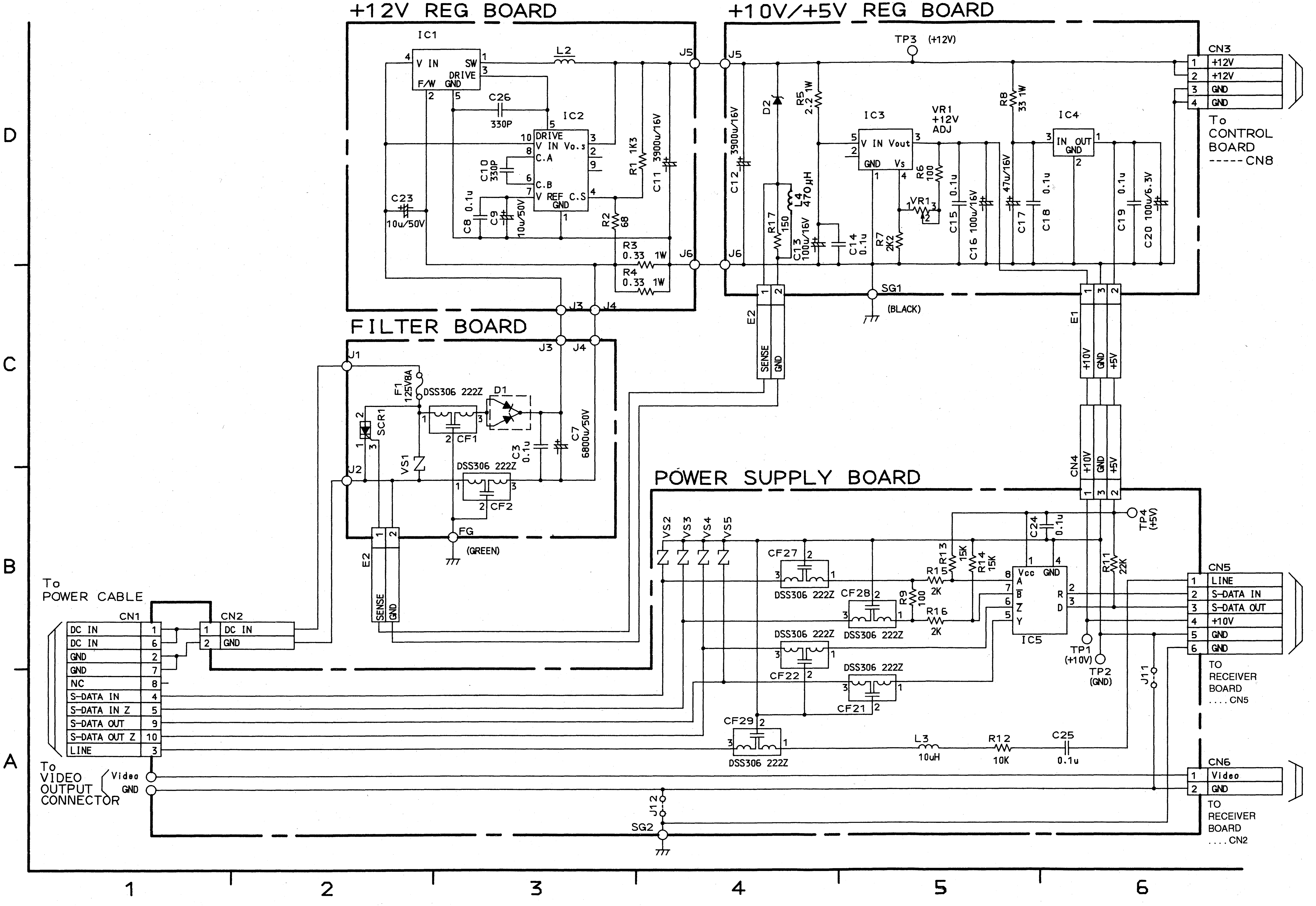
SCHEMATIC DIAGRAM OF POWER SUPPLY BOARD


+12V REG BOARD
+10V/+5V REG BOARD
FILTER BOARD
POWER SUPPLY BOARD
IC1
V IN
SW
DRIVE
F/W
GND
L2
C26
330P
IC2
DRIVE
V IN Vo.s
C.A
C.B
V REF C.S
GND
C10
330P
C8 0.1u
C9
10u/50V
C23
10u/50V
R1 1K3
C11 3900u/16V
R2 68
R3 0.33 1W
R4 0.33 1W
J5
J6
J3
J4
TP3 (+12V)
D2
R5 2.2 1W
C12 3900u/16V
R17 150
L4 470μH
C13 100u/16V
C14 0.1u
IC3
V IN Vout
GND Vs
VR1 +12V ADJ
R6 100
R7 2K2
C15 0.1u
C16 100u/16V
R8 33 1W
C17 47u/16V
C18 0.1u
IC4
IN OUT
GND
C19 0.1u
C20 100u/6.3V
CN3
+12V
+12V
GND
GND
To CONTROL BOARD -----CN8
SG1
(BLACK)
E2
SENSE
GND
E1
+10V
GND
+5V
J1
J2
F1 125V8A
DSS306 222Z
D1
CF1
SCR1
VS1
C3 0.1u
C7 6800u/50V
CF2
FG
(GREEN)
CN4
+10V
GND
+5V
TP4 (+5V)
C24 0.1u
VS2
VS3
VS4
VS5
CF27
CF28
CF22
CF21
CF29
R13 15K
R14 15K
R15 2K
R16 2K
R9 100
IC5
Vcc GND
A
B
Z
Y
R
D
R11 22K
TP1 (+10V)
TP2 (GND)
J11
J12
L3 10uH
R12 10K
C25 0.1u
SG2
CN5
LINE
S-DATA IN
S-DATA OUT
+10V
GND
GND
TO RECEIVER BOARD CN5
CN6
Video
GND
TO RECEIVER BOARD CN2
To POWER CABLE
CN1
DC IN
DC IN
GND
GND
NC
S-DATA IN
S-DATA IN Z
S-DATA OUT
S-DATA OUT Z
LINE
CN2
DC IN
GND
To VIDEO OUTPUT CONNECTOR
Video
GND
A
B
C
D
1
2
3
4
5
6

+12V REG BOARD (COMPONENT SIDE)

+10V/+5V REG BOARD

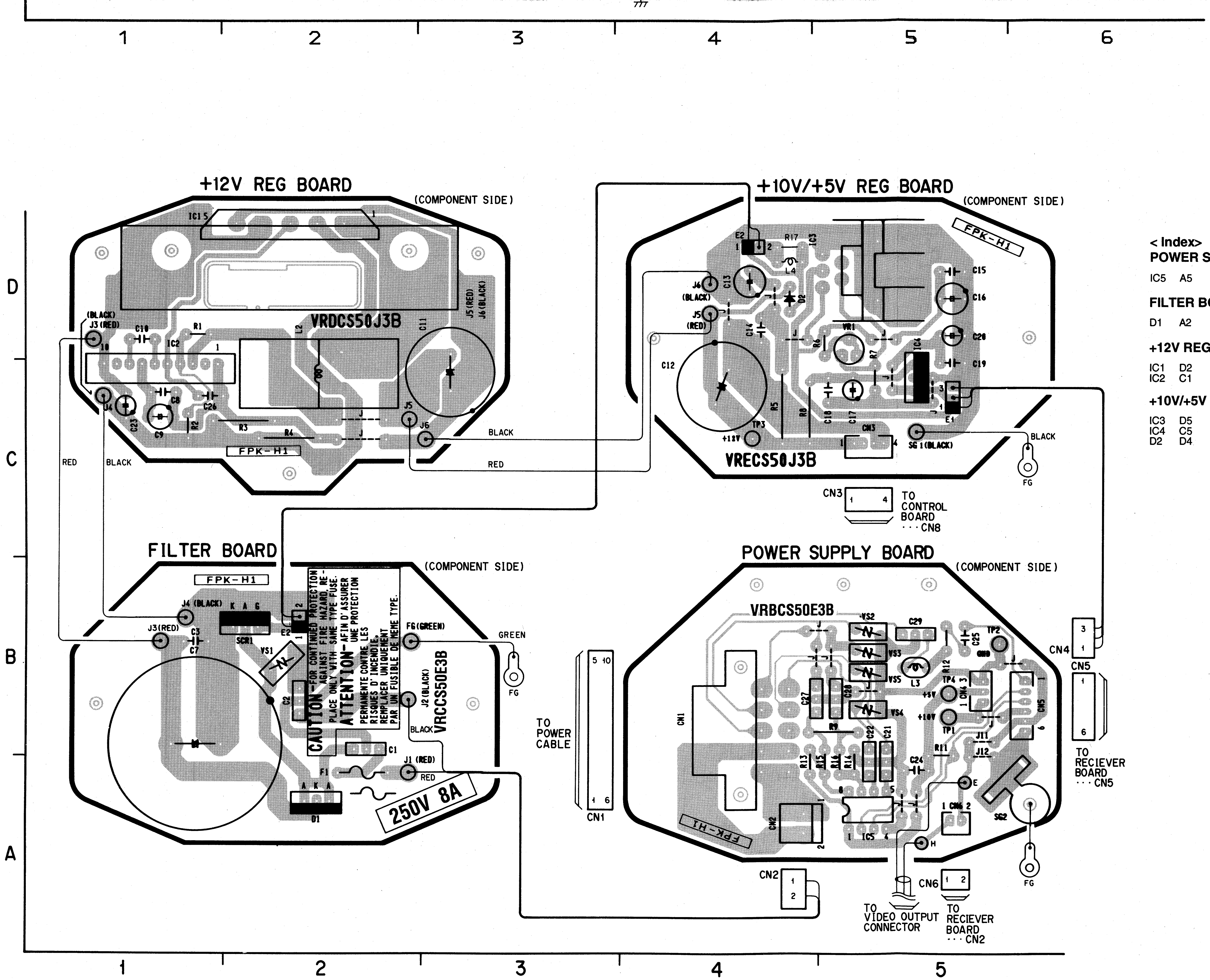
SCHEMATIC DIAGRAM OF POWER SUPPLY BOARD


+12V REG BOARD
+10V/+5V REG BOARD
FILTER BOARD
POWER SUPPLY BOARD
IC1
V IN
SW
DRIVE
F/W
GND
L2
J5
J6
C26
330P
IC2
DRIVE
V IN Vo.s
C.A
C.B
V REF C.S
GND
C10
330P
C8 0.1u
C9
10u/50V
C23
10u/50V
R1 1K3
C11 3900u/16V
R2 68
R3 0.33 1W
R4 0.33 1W
J3
J4
TP3 (+12V)
D2
R5 2.2 1W
C12 3900u/16V
L4 470μH
R17 150
C13 100u/16V
C14 0.1u
IC3
V IN Vout
GND Vs
VR1 +12V ADJ
R6 100
R7 2K2
C15 0.1u
C16 100u/16V
R8 33 1W
C17 47u/16V
C18 0.1u
IC4
IN OUT
GND
C19 0.1u
C20 100u/6.3V
SG1
(BLACK)
CN3
+12V
+12V
GND
GND
To CONTROL BOARD -----CN8
E1
+10V
GND
+5V
E2
SENSE
GND
J1
J2
F1 125V8A
DSS306 222Z
D1
SCR1
VS1
CF1
C3 0.1u
C7 6800u/50V
CF2
FG
(GREEN)
CN4
+10V
GND
+5V
TP4 (+5V)
VS2
VS3
VS4
VS5
CF27
CF28
CF22
CF21
CF29
DSS306 222Z
R13 15K
R14 15K
R15 2K
R16 2K
R9 100
C24 0.1u
IC5
Vcc GND
A
B
Z
Y
R
D
R11 22K
TP1 (+10V)
TP2 (GND)
J11
J12
SG2
L3 10uH
R12 10K
C25 0.1u
CN5
LINE
S-DATA IN
S-DATA OUT
+10V
GND
GND
TO RECEIVER BOARD CN5
CN6
Video
GND
TO RECEIVER BOARD CN2
To POWER CABLE
CN1
DC IN 1
DC IN 6
GND 2
GND 7
NC 8
S-DATA IN 4
S-DATA IN Z 5
S-DATA OUT 9
S-DATA OUT Z 10
LINE 3
CN2
DC IN
GND
To VIDEO OUTPUT CONNECTOR
Video
GND
D
C
B
A
1
2
3
4
5
6

+12V REG BOARD (COMPONENT SIDE)

+10V/+5V REG BOARD

CONDUCTOR VIEW OF POWER SUPPLY BOARD



1
2
3
4
5
6
D
C
B
A
+12V REG BOARD
(COMPONENT SIDE)
VRDCS50J3B
FPK-H1
IC1 5
IC2
C10
R1
L2
C11
J5 (RED)
J6 (BLACK)
(BLACK)
J3 (RED)
J4
C23
C9
C8
C26
R2
R3
R4
J5
J6
BLACK
RED
+10V/+5V REG BOARD
(COMPONENT SIDE)
FPK-H1
E2
R17
IC3
L4
C13
D2
J6 (BLACK)
J5 (RED)
C14
C12
R6
VR1
R7
IC4
C15
C16
C20
C19
R5
R8
C18
C17
TP3
+12V
CN3
E1
SG 1 (BLACK)
BLACK
FG
VRECS50J3B
CN3
TO CONTROL BOARD ··· CN8
FILTER BOARD
(COMPONENT SIDE)
FPK-H1
J4 (BLACK)
K A G
SCR1
J3 (RED)
C3
C7
VS1
E2
C2
F6 (GREEN)
GREEN
FG
J2 (BLACK)
BLACK
VRCCS50E3B
C1
J1 (RED)
RED
F1
A K A
D1
250V 8A
CAUTION—FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH SAME TYPE FUSE.
ATTENTION—AFIN D'ASSURER UNE PROTECTION PERMANENTE CONTRE LES RISQUES D'INCENDIE, REMPLACER UNIQUEMENT PAR UN FUSIBLE DE MEME TYPE.
TO POWER CABLE
CN1
POWER SUPPLY BOARD
(COMPONENT SIDE)
VRBCS50E3B
VS2
C29
C25
TP2
VS3
VS5
L3
R12
GND
TP4
CN4
CN5
C27
C28
VS4
+5V
+10V
TP1
R9
C22
C21
J11
J12
R11
R13
R15
R14
C24
E
IC5
CN2
CN6
SG2
H
FG
FPK-H1
CN4
CN5
TO RECIEVER BOARD ··· CN5
CN2
CN6
TO VIDEO OUTPUT CONNECTOR
TO RECIEVER BOARD ··· CN2

< Index>

POWER SUPPLY BOARD

IC5	A5

FILTER BOARD

D1	A2

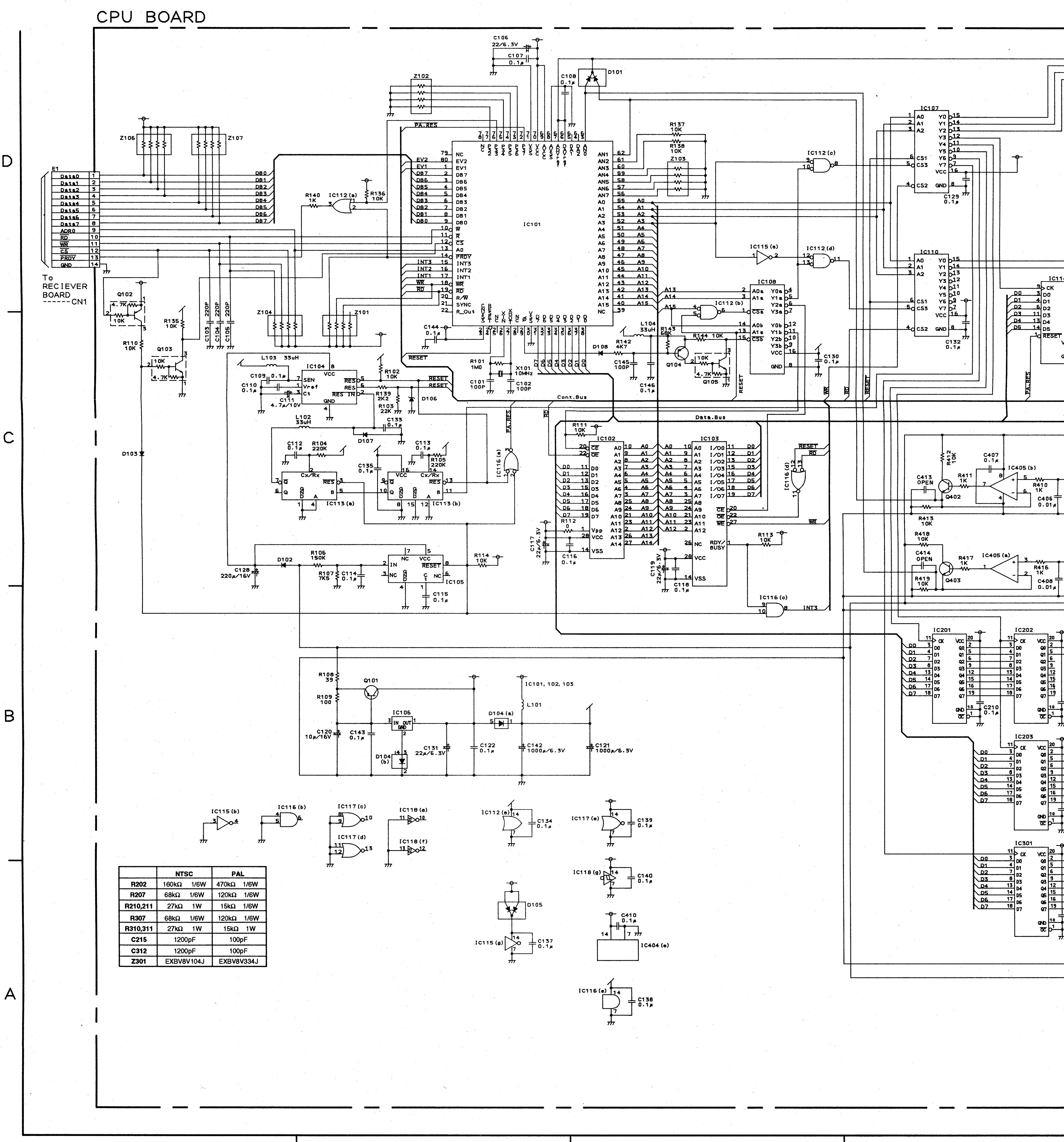
+12V REG BOARD

IC1	D2		
IC2	C1		

+10V/+5V REG BOARD

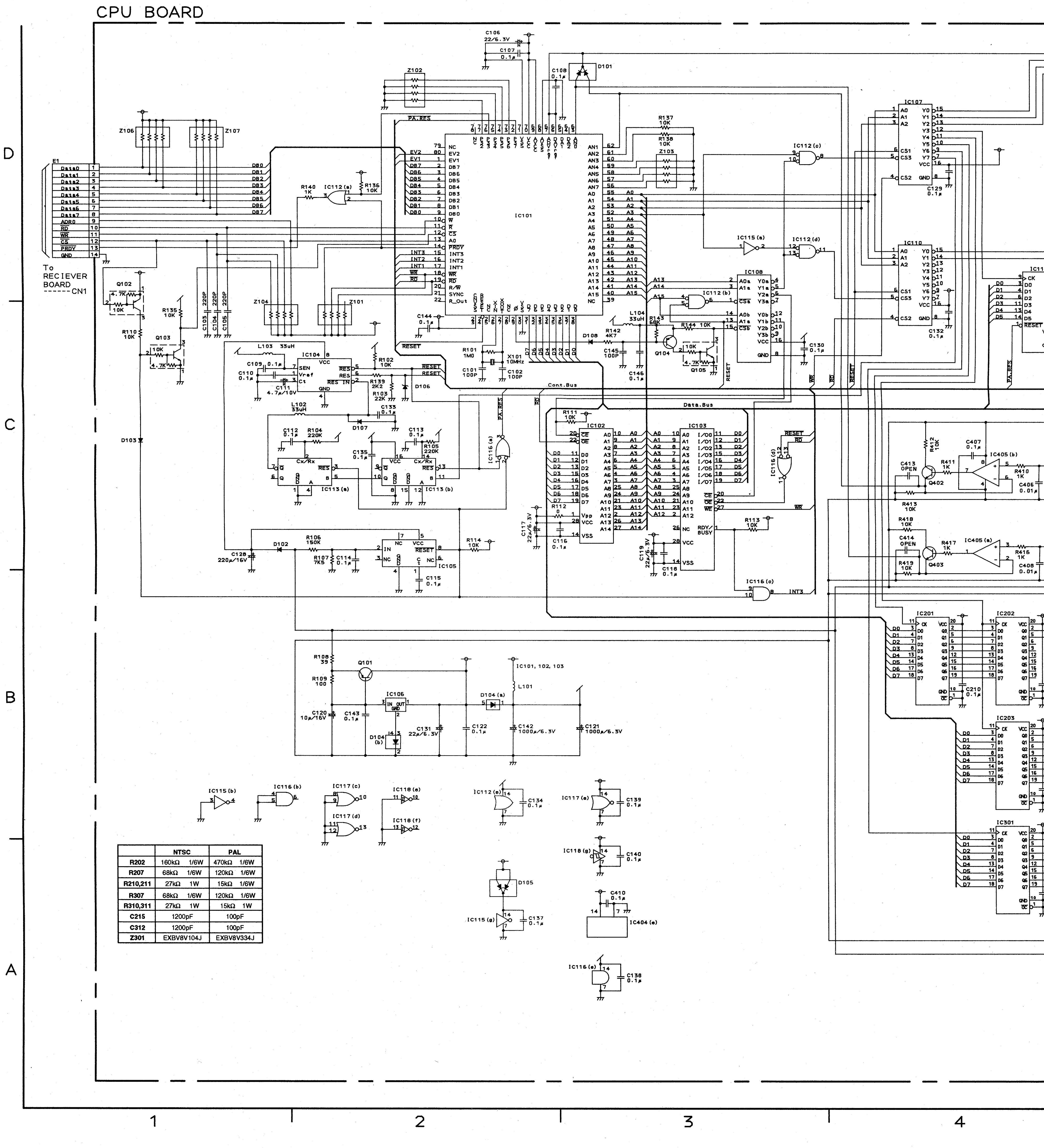
IC3	D5		
IC4	C5		
D2	D4		

SCHEMATIC DIAGRAM OF


CPU BOARD
To RECIEVER BOARD
CN1
E1
Data0
Data1
Data2
Data3
Data4
Data5
Data6
Data7
ADR0
RD
WR
CS
PRDY
GND
IC101
IC102
IC103
IC104
IC105
IC106
IC107
IC108
IC110
IC112 (a)
IC112 (b)
IC112 (c)
IC112 (d)
IC112 (e)
IC113 (a)
IC113 (b)
IC115 (a)
IC115 (b)
IC115 (g)
IC116 (a)
IC116 (b)
IC116 (c)
IC116 (d)
IC116 (e)
IC117 (c)
IC117 (d)
IC117 (e)
IC118 (e)
IC118 (f)
IC118 (g)
IC201
IC202
IC203
IC301
IC404 (e)
IC405 (a)
IC405 (b)
Q101
Q102
Q103
Q104
Q105
Q402
Q403
X101 10MHz
L101
L102 33uH
L103 33uH
L104 33uH
D101
D102
D103
D104 (a)
D104 (b)
D105
D106
D107
D108
Z101
Z102
Z103
Z104
Z106
Z107
PA.RES
RESET
Cont.Bus
Data.Bus
INT3
IC101, 102, 103
C106 22/6.3V
C107 0.1μ
C108 0.1μ
C103 220P
C104 220P
C105 220P
C128 220μ/16V
C120 10μ/16V
C142 1000μ/6.3V
C121 1000μ/6.3V
C131 22μ/6.3V
C117 22μ/6.3V
C119 22μ/6.3V
R101 1M0
R140 1K
R136 10K
R137 10K
R138 10K
R106 150K
R107 7K5
R108 39
R109 100
R110 10K
R135 10K
R114 10K
R113 10K
R111 10K
R112 0
R142 4K7
R143 68K
R144 10K
C413 OPEN
C414 OPEN
C101 100P
C102 100P
C145 100P
C146 0.1μ
C144 0.1μ
C210 0.1μ
C129 0.1μ
C130 0.1μ
C132 0.1μ
C407 0.1μ
C406 0.01μ
C408 0.01μ
C410 0.1μ
R410 1K
R411 1K
R412 10K
R413 10K
R416 1K
R417 1K
R418 10K
R419 10K
1
2
3
4
A
B
C
D

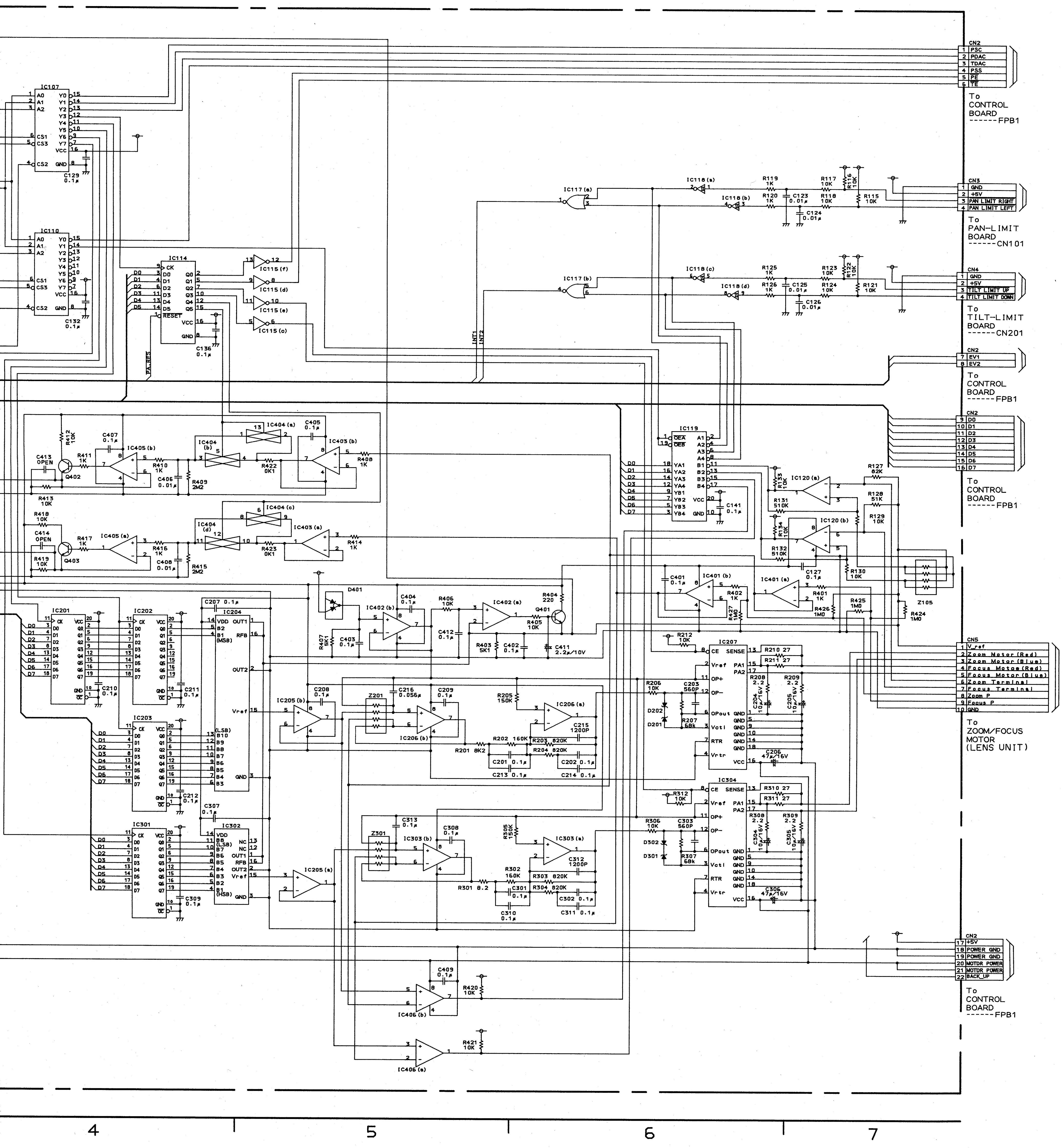
	NTSC	PAL
R202	160kΩ 1/6W	470kΩ 1/6W
R207	68kΩ 1/6W	120kΩ 1/6W
R210,211	27kΩ 1W	15kΩ 1/6W
R307	68kΩ 1/6W	120kΩ 1/6W
R310,311	27kΩ 1W	15kΩ 1W
C215	1200pF	100pF
C312	1200pF	100pF
Z301	EXBV8V104J	EXBV8V334J

SCHEMATIC DIAGRAM O

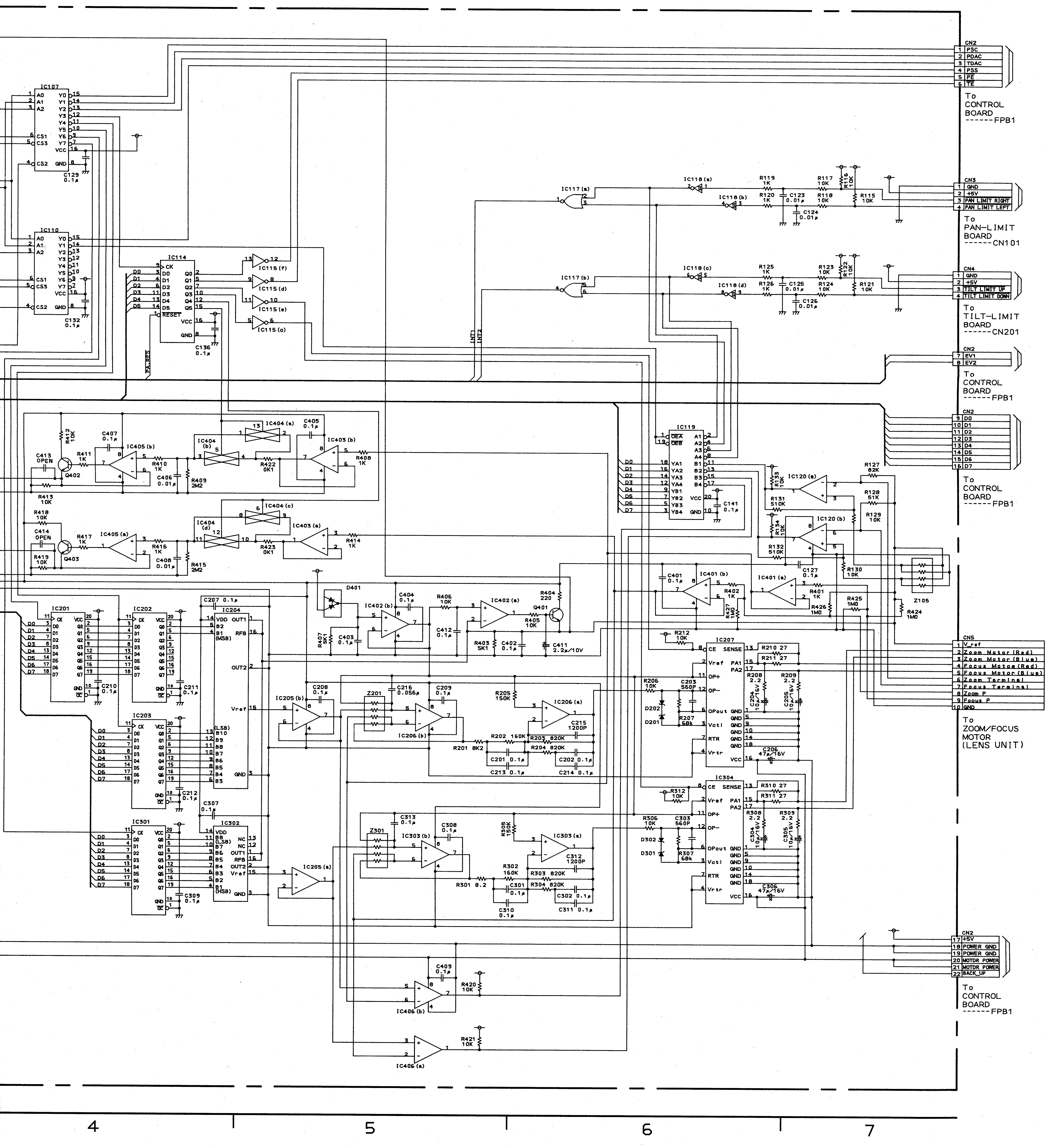

CPU BOARD
To RECIEVER BOARD ------CN1
E1
Data0
Data1
Data2
Data3
Data4
Data5
Data6
Data7
ADR0
RD
WR
CS
PRDY
GND
IC101
IC102
IC103
IC104
IC105
IC106
IC107
IC108
IC110
IC112 (a)
IC112 (b)
IC112 (c)
IC112 (d)
IC113 (a)
IC113 (b)
IC115 (a)
IC116 (a)
IC116 (c)
IC116 (d)
IC201
IC202
IC203
IC301
IC405 (a)
IC405 (b)
IC404 (e)
Q101
Q102
Q103
Q104
Q105
Q402
Q403
Z101
Z102
Z103
Z104
Z106
Z107
X101 10MHz
L101
L102 33uH
L103 33uH
L104 33uH
D101
D102
D103
D104 (a)
D104 (b)
D105
D106
D107
D108
PA.RES
RESET
Cont.Bus
Data.Bus
INT3
IC101, 102, 103
A
B
C
D
1
2
3
4

	NTSC	PAL
R202	160kΩ 1/6W	470kΩ 1/6W
R207	68kΩ 1/6W	120kΩ 1/6W
R210,211	27kΩ 1W	15kΩ 1/6W
R307	68kΩ 1/6W	120kΩ 1/6W
R310,311	27kΩ 1W	15kΩ 1W
C215	1200pF	100pF
C312	1200pF	100pF
Z301	EXBV8V104J	EXBV8V334J

TIC DIAGRAM OF CPU BOARD


IC107
IC110
IC114
IC115 (f)
IC115 (d)
IC115 (e)
IC115 (c)
IC117 (a)
IC117 (b)
IC118 (a)
IC118 (b)
IC118 (c)
IC118 (d)
IC119
IC120 (a)
IC120 (b)
IC201
IC202
IC203
IC204
IC205 (a)
IC205 (b)
IC206 (a)
IC206 (b)
IC207
IC301
IC302
IC303 (a)
IC303 (b)
IC304
IC401 (a)
IC401 (b)
IC402 (a)
IC402 (b)
IC403 (a)
IC403 (b)
IC404 (a)
IC404 (b)
IC404 (c)
IC404 (d)
IC405 (a)
IC405 (b)
IC406 (a)
IC406 (b)
Q401
Q402
Q403
D401
Z105
Z201
Z301
PA.RES
INT1
INT2
CN2
1 PSC
2 PDAC
3 TDAC
4 PSS
5 PE
6 TE
To CONTROL BOARD ------FPB1
CN3
1 GND
2 +5V
3 PAN LIMIT RIGHT
4 PAN LIMIT LEFT
To PAN-LIMIT BOARD ------CN101
CN4
1 GND
2 +5V
3 TILT LIMIT UP
4 TILT LIMIT DOWN
To TILT-LIMIT BOARD ------CN201
CN2
7 EV1
8 EV2
To CONTROL BOARD ------FPB1
CN2
9 D0
10 D1
11 D2
12 D3
13 D4
14 D5
15 D6
16 D7
To CONTROL BOARD ------FPB1
CN5
1 V_ref
2 Zoom Motor (Red)
3 Zoom Motor (Blue)
4 Focus Motor (Red)
5 Focus Motor (Blue)
6 Zoom Terminal
7 Focus Terminal
8 Zoom P
9 Focus P
10 GND
To ZOOM/FOCUS MOTOR (LENS UNIT)
CN2
17 +5V
18 POWER GND
19 POWER GND
20 MOTOR POWER
21 MOTOR POWER
22 BACK_UP
To CONTROL BOARD ------FPB1
4
5
6
7

TIC DIAGRAM OF CPU BOARD


CN2
1 PSC
2 PDAC
3 TDAC
4 PSS
5 PE
6 TE
To CONTROL BOARD ------FPB1
CN3
1 GND
2 +5V
3 PAN LIMIT RIGHT
4 PAN LIMIT LEFT
To PAN-LIMIT BOARD ------CN101
CN4
1 GND
2 +5V
3 TILT LIMIT UP
4 TILT LIMIT DOWN
To TILT-LIMIT BOARD ------CN201
CN2
7 EV1
8 EV2
To CONTROL BOARD ------FPB1
CN2
9 D0
10 D1
11 D2
12 D3
13 D4
14 D5
15 D6
16 D7
To CONTROL BOARD ------FPB1
CN5
1 V_ref
2 Zoom Motor (Red)
3 Zoom Motor (Blue)
4 Focus Motor (Red)
5 Focus Motor (Blue)
6 Zoom Terminal
7 Focus Terminal
8 Zoom P
9 Focus P
10 GND
To ZOOM/FOCUS MOTOR (LENS UNIT)
CN2
17 +5V
18 POWER GND
19 POWER GND
20 MOTOR POWER
21 MOTOR POWER
22 BACK_UP
To CONTROL BOARD ------FPB1
IC107
IC110
IC114
IC115
IC117
IC118
IC119
IC120
IC201
IC202
IC203
IC204
IC205
IC206
IC207
IC301
IC302
IC303
IC304
IC401
IC402
IC403
IC404
IC405
IC406
Q401
Q402
Q403
D401
Z105
Z201
Z301
PA.RES
INT1
INT2
4
5
6
7

< Index>
CPU BOARD

IC101	D2
IC102	C3
IC103	C3
IC104	C2
IC105	C2
IC106	B2
IC107	D4
IC108	D3
IC110	D4
IC112	D2
IC113	C2
IC114	D4
IC115	D3
IC116	C2
IC117	D6
IC118	D6
IC119	C6
IC120	C7
IC201	B4
IC202	B4
IC203	B4
IC204	B4
IC205	B5
IC206	B6
IC207	B6
IC301	B4
IC302	B4
IC303	B6
IC304	B6
IC401	B6
IC402	B5
IC403	C5
IC404	C5
IC405	C4
IC406	A5
Q101	B2
Q102	D1
Q103	C1
Q104	C3
Q105	C3
Q401	B6
Q402	C4
Q403	C4
D101	D3
D102	C1
D103	C1
D104	B2
D105	A2
D106	C2
D107	C2
D108	C3
D201	B6
D202	B6
D301	B6
D302	B6
D401	B5

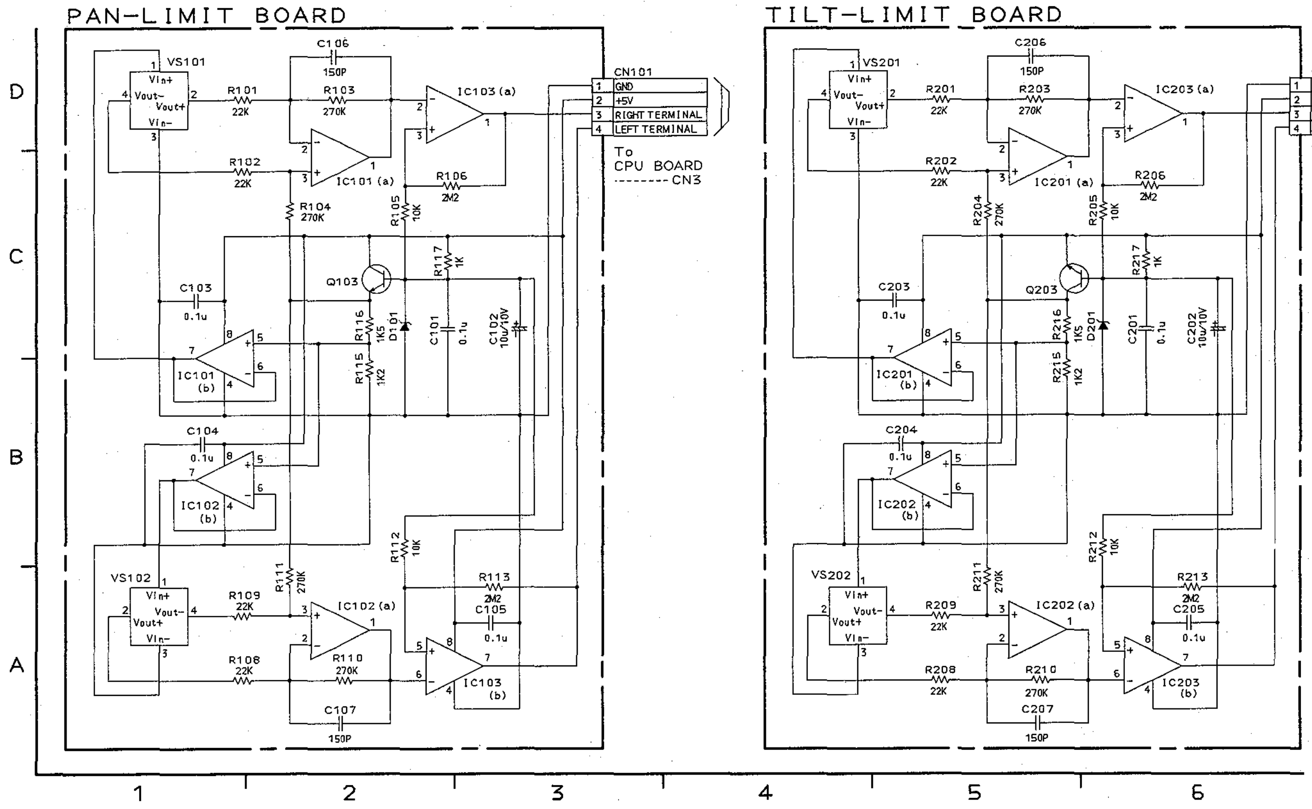
< Index>
TILT LIMIT BOARD

IC201	C5
IC202	A5
IC203	D6
Q201	D4
Q202	A4
Q203	C5
D201	C6

< Index>
PAN LIMIT BOARD

IC101	C2
IC102	A2
IC103	D3
Q101	D1
Q102	A1
Q103	C2
D101	C2

SCHEMATIC DIAGRAM OF TILT LIMIT BOARD AND PAN LIMIT BOARD


PAN-LIMIT BOARD
TILT-LIMIT BOARD
VS101
Vin+
Vout-
Vout+
Vin-
R101 22K
R102 22K
R103 270K
R104 270K
R105 10K
R106 2M2
C106 150P
IC101 (a)
IC103 (a)
CN101
1 GND
2 +5V
3 RIGHT TERMINAL
4 LEFT TERMINAL
To CPU BOARD --------CN3
C103 0.1u
Q103
R116 1K5
R115 1K2
R117 1K
D101
C101 0.1u
C102 10u/10V
IC101 (b)
C104 0.1u
IC102 (b)
VS102
R109 22K
R108 22K
R111 270K
R112 10K
R110 270K
R113 2M2
C105 0.1u
C107 150P
IC102 (a)
IC103 (b)
VS201
R201 22K
R202 22K
R203 270K
R204 270K
R205 10K
R206 2M2
C206 150P
IC201 (a)
IC203 (a)
CN201
1 GND
2 +5V
3 UP TERMINAL
4 DOWN TERMINAL
To CPU BOARD --------CN4
C203 0.1u
Q203
R216 1K5
R215 1K2
R217 1K
D201
C201 0.1u
C202 10u/10V
IC201 (b)
C204 0.1u
IC202 (b)
VS202
R209 22K
R208 22K
R211 270K
R212 10K
R210 270K
R213 2M2
C205 0.1u
C207 150P
IC202 (a)
IC203 (b)
D
C
B
A
1
2
3
4
5
6

< Index>
CPU BOARD

IC101	C2	IC401	D9
IC102	D3	IC402	D6
IC103	D3	IC403	D4
IC104	C9	IC404	D4
IC105	C9	IC405	D4
IC106	C6	IC406	D3
IC107	B2	Q101	C6
IC108	B9	Q102	A9
IC110	B9	Q103	A9
IC112	B2	Q104	B9
IC113	C9	Q105	B9
IC114	B2	Q401	D6
IC115	B9	Q402	D4
IC116	C3	Q403	D4
IC117	D7	D101	C2
IC118	D4	D102	C2
IC119	D7	D103	A2
IC120	D9	D104	C6
IC201	C4	D105	B9
IC202	C7	D106	C9
IC203	C4	D107	C9
IC204	C6	D108	B9
IC205	D7	D201	D2
IC206	D8	D202	D2
IC207	C2	D301	D2
IC301	C4	D302	D2
IC302	C7	D401	D6
IC303	D8		
IC304	D2		

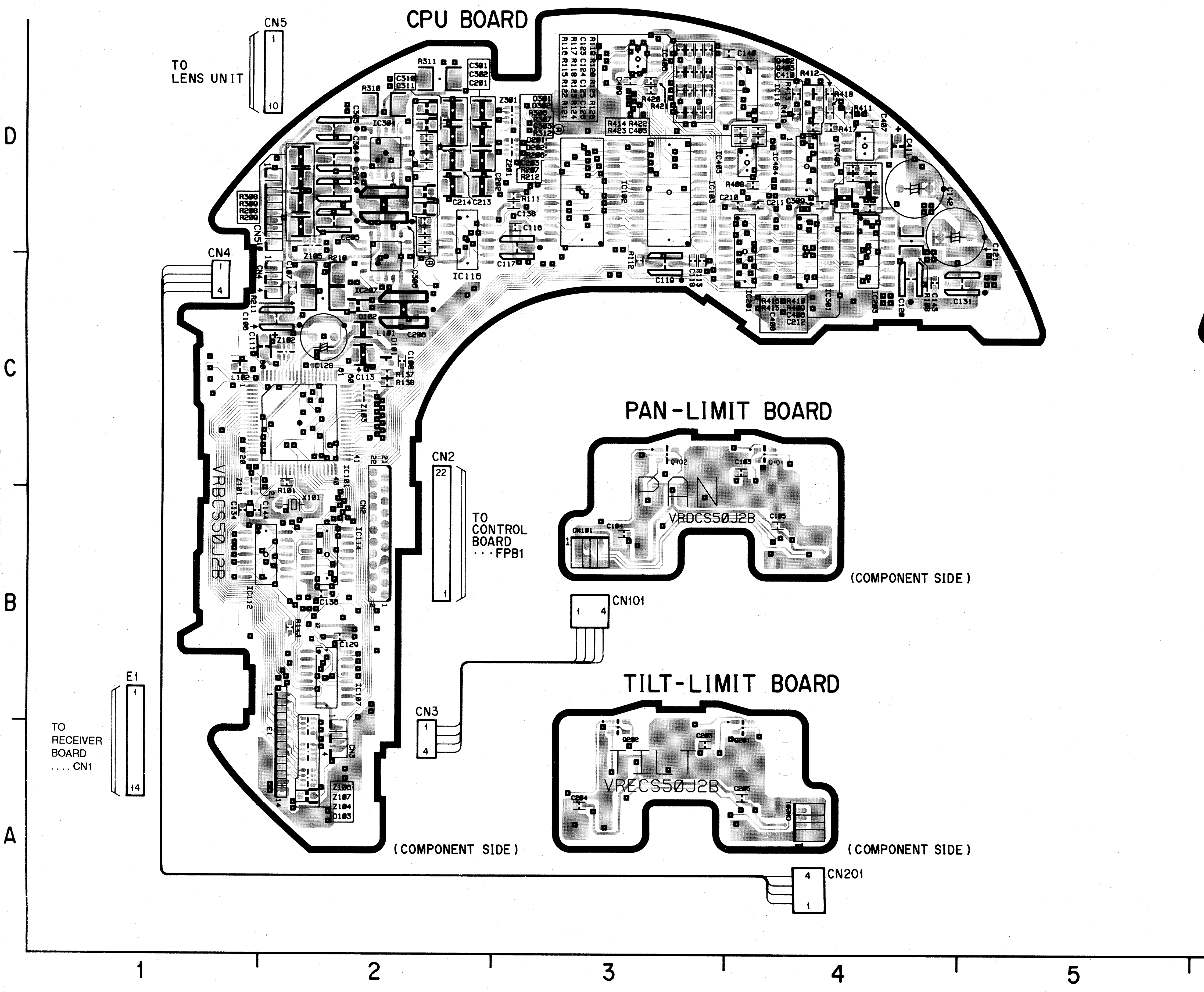
< Index>
TILT LIMIT BOARD

IC201	A7
IC202	A7
IC203	A7
Q201	A4
Q202	A3

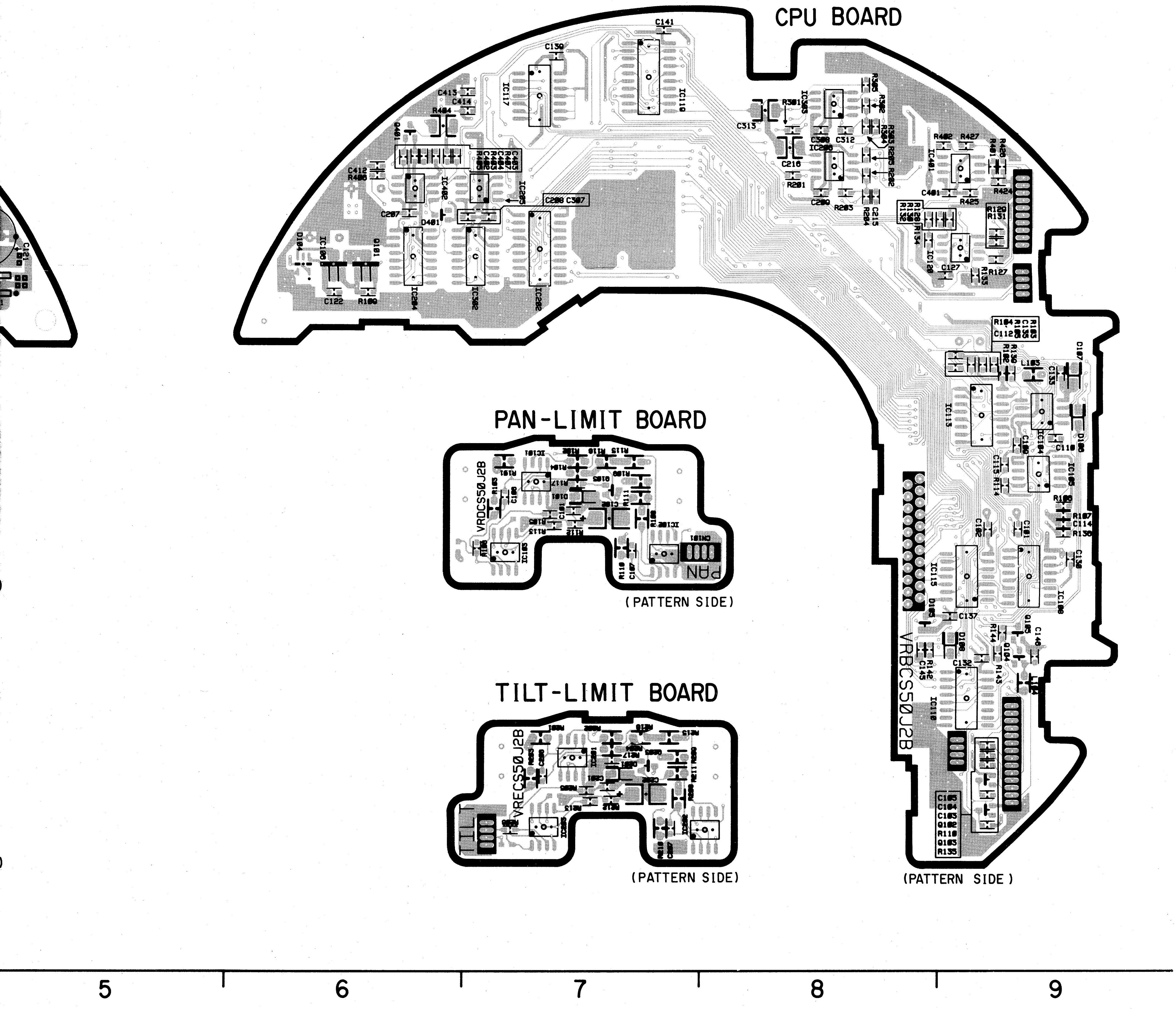
< Index>
PAN LIMIT BOARD

IC101	C7
IC102	B7
IC103	B7
Q101	C4
Q102	C3
Q103	B7
D101	B7

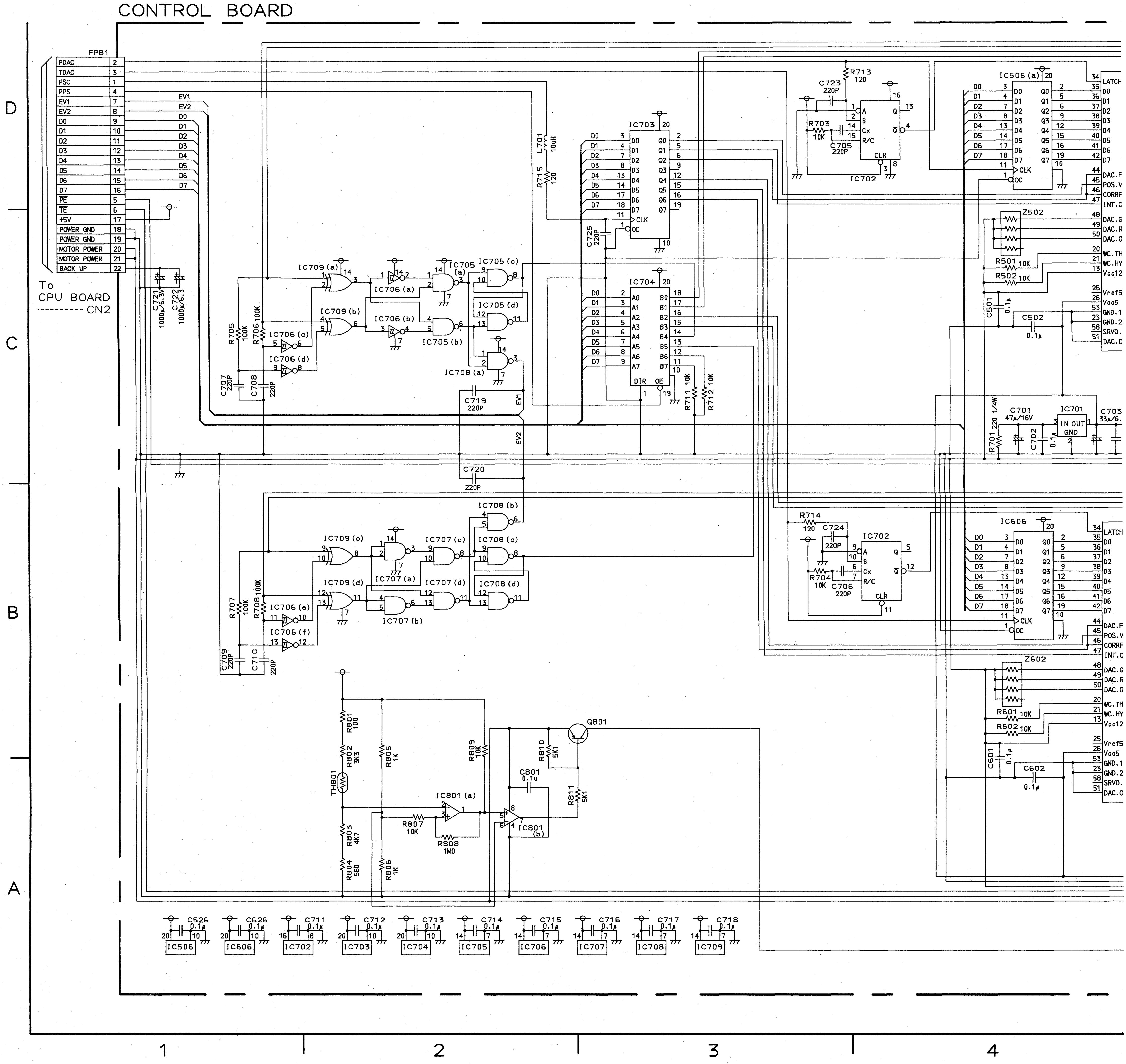
CONDUCTOR VIEW OF CPU B


CPU BOARD
PAN-LIMIT BOARD
TILT-LIMIT BOARD
TO LENS UNIT
CN5
CN4
CN3
CN2
TO CONTROL BOARD ···FPB1
CN101
CN201
E1
TO RECEIVER BOARD CN1
(COMPONENT SIDE)
(COMPONENT SIDE)
(COMPONENT SIDE)
VRBCS50J2B
VRDCS50J2B
VRECS50J2B
PAN
TILT
A
B
C
D
1
2
3
4
5

VIEW OF CPU BOARD


CPU BOARD
VRBCS50J2B
(PATTERN SIDE)
PAN-LIMIT BOARD
VRDCS50J2B
PAN
(PATTERN SIDE)
TILT-LIMIT BOARD
VRECS50J2B
(PATTERN SIDE)
5
6
7
8
9

SCHEMATIC DIAGRAM OF C

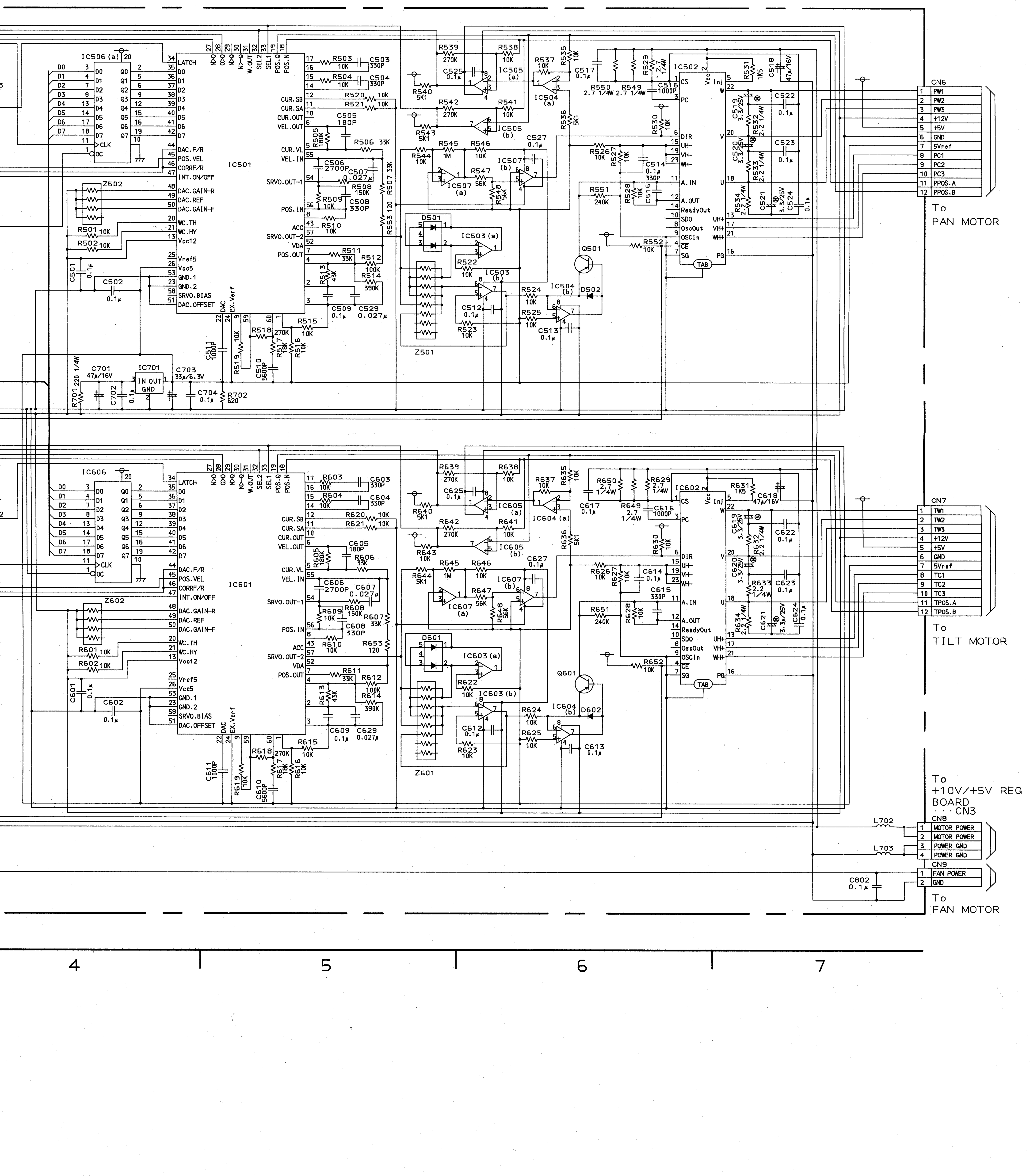

CONTROL BOARD
FPB1
PDAC 2
TDAC 3
PSC 1
PPS 4
EV1 7
EV2 8
D0 9
D1 10
D2 11
D3 12
D4 13
D5 14
D6 15
D7 16
PE 5
TE 6
+5V 17
POWER GND 18
POWER GND 19
MOTOR POWER 20
MOTOR POWER 21
BACK UP 22
To CPU BOARD CN2
C721 1000µ/6.3V
C722 1000µ/6.3
IC709 (a)
IC709 (b)
IC709 (c)
IC709 (d)
IC706 (a)
IC706 (b)
IC706 (c)
IC706 (d)
IC706 (e)
IC706 (f)
IC705 (a)
IC705 (b)
IC705 (c)
IC705 (d)
IC707 (a)
IC707 (b)
IC707 (c)
IC707 (d)
IC708 (a)
IC708 (b)
IC708 (c)
IC708 (d)
R705 100K
R706 100K
R707 100K
R708 100K
C707 220P
C708 220P
C709 220P
C710 220P
C719 220P
C720 220P
EV1
EV2
L701 10uH
R715 120
C725 220P
IC703
IC704
R711 10K
R712 10K
IC702
R713 120
C723 220P
R703 10K
C705 220P
R714 120
C724 220P
R704 10K
C706 220P
IC506 (a)
IC606
Z502
Z602
R501 10K
R502 10K
R601 10K
R602 10K
C501 0.1µ
C502 0.1µ
C601 0.1µ
C602 0.1µ
R701 220 1/4W
C701 47µ/16V
C702 0.1µ
IC701
IN OUT GND
C703 33µ/6.
LATCH
DAC.F
POS.V
CORRF
INT.C
DAC.G
DAC.R
WC.TH
WC.HY
Vcc12
Vref5
Vcc5
GND.1
GND.2
SRVO.
DAC.O
Q801
R801 100
R802 3K3
TH801
R803 4K7
R804 560
R805 1K
R806 1K
R807 10K
R808 1M0
R809 10K
R810 5K1
R811 5K1
C801 0.1u
IC801 (a)
IC801 (b)
C526 0.1µ
C626 0.1µ
C711 0.1µ
C712 0.1µ
C713 0.1µ
C714 0.1µ
C715 0.1µ
C716 0.1µ
C717 0.1µ
C718 0.1µ
IC506
IC606
IC702
IC703
IC704
IC705
IC706
IC707
IC708
IC709
A
B
C
D
1
2
3
4

< Index>

CONTROL BOARD

IC501	D5
IC502	D6
IC503	C6
IC504	D6
IC505	D6
IC506	D4
IC507	D5
IC601	B5
IC602	B6
IC603	B6
IC604	B6
IC605	B6
IC606	B4
IC607	B5
IC701	C4
IC702	D4
IC703	D3
IC704	C3
IC705	C2
IC706	C2
IC707	B2
IC708	C2
IC709	C2
IC801	A2
Q501	C6
Q601	B6
Q801	B3
D501	C5
D502	C6
D601	B5
D602	A6

DIAGRAM OF CONTROL BOARD

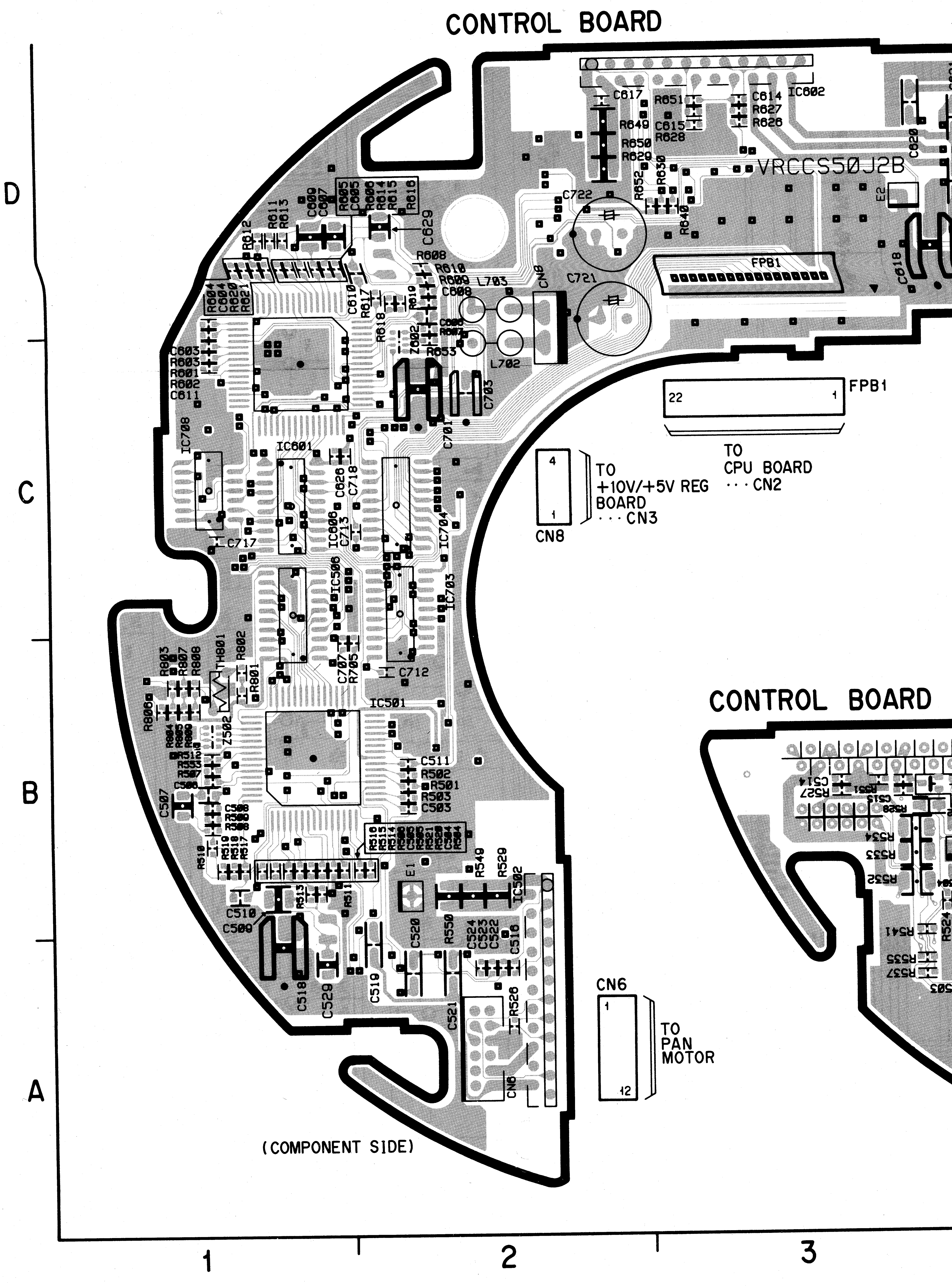


IC506 (a)
IC501
IC502
IC503 (a)
IC503 (b)
IC504 (a)
IC504 (b)
IC505 (a)
IC505 (b)
IC507 (a)
IC507 (b)
IC701
IN OUT
GND
Z501
Z502
D501
D502
Q501
IC606
IC601
IC602
IC603 (a)
IC603 (b)
IC604 (a)
IC604 (b)
IC605 (a)
IC605 (b)
IC607 (a)
IC607 (b)
Z601
Z602
D601
D602
Q601
D0
D1
D2
D3
D4
D5
D6
D7
Q0
Q1
Q2
Q3
Q4
Q5
Q6
Q7
CLK
OC
LATCH
DAC.F/R
POS.VEL
CORRF/R
INT.ON/OFF
DAC.GAIN-R
DAC.REF
DAC.GAIN-F
WC.TH
WC.HY
Vcc12
Vref5
Vcc5
GND.1
GND.2
SRVO.BIAS
DAC.OFFSET
DAC
EX.Verf
W.OUT
SEL2
SEL1
POS.Q
POS.N
CUR.SB
CUR.SA
CUR.OUT
VEL.OUT
CUR.VL
VEL.IN
SRVO.OUT-1
POS.IN
ACC
SRVO.OUT-2
VDA
POS.OUT
CS
Vcc
Inj
PC
DIR
UH+
VH+
WH+
A.IN
A.OUT
ReadyOut
SDO
OscOut
OSCIn
CE
SG
TAB
PG
U
V
W
R501 10K
R502 10K
C501 0.1µ
C502 0.1µ
R503 10K
C503 330P
R504 10K
C504 330P
R505 180K
C505 180P
R506 33K
C506 2700P
C507 0.027µ
R507 33K
R508 150K
R509 10K
C508 330P
R510 10K
R553 120
R511 33K
R512 100K
R513 43K
R514 390K
C509 0.1µ
C529 0.027µ
R515 10K
R516 10K
R517 18K
R518 270K
R519 10K
C510 5600P
C511 1000P
R520 10K
R521 10K
R522 10K
R523 10K
R524 10K
R525 10K
C512 0.1µ
C513 0.1µ
R526 10K
R527 10K
R528 10K
C514 0.1µ
C515 330P
R529 2.7 1/4W
R530 10K
R531 1K5
R532 2.2 1/4W
R533 2.2 1/4W
R534 2.2 1/4W
R535 10K
R536 5K1
R537 10K
R538 10K
R539 270K
R540 5K1
R541 10K
R542 270K
R543 5K1
R544 10K
R545 1M
R546 10K
R547 56K
R548 56K
R549 2.7 1/4W
R550 2.7 1/4W
R551 240K
R552 10K
C516 1000P
C517 0.1µ
C518 47µ/16V
C519 3.3/25V
C520 3.3/25V
C521 3.3/25V
C522 0.1µ
C523 0.1µ
C524 0.1µ
C525 0.1µ
C527 0.1µ
R701 220 1/4W
C701 47µ/16V
C702 0.1µ
C703 33µ/6.3V
C704 0.1µ
R702 620
R601 10K
R602 10K
C601 0.1µ
C602 0.1µ
R603 10K
C603 330P
R604 10K
C604 330P
R605 180K
C605 180P
R606 33K
C606 2700P
C607 0.027µ
R607 33K
R608 150K
R609 10K
C608 330P
R610 10K
R653 120
R611 33K
R612 100K
R613 43K
R614 390K
C609 0.1µ
C629 0.027µ
R615 10K
R616 10K
R617 18K
R618 270K
R619 10K
C610 5600P
C611 1000P
R620 10K
R621 10K
R622 10K
R623 10K
R624 10K
R625 10K
C612 0.1µ
C613 0.1µ
R626 10K
R627 10K
R628 10K
C614 0.1µ
C615 330P
R629 2.7 1/4W
R630 10K
R631 1K5
R632 2.2 1/4W
R633 2.2 1/4W
R634 2.2 1/4W
R635 10K
R636 5K1
R637 10K
R638 10K
R639 270K
R640 5K1
R641 10K
R642 270K
R643 10K
R644 5K1
R645 1M
R646 10K
R647 56K
R648 56K
R649 2.7 1/4W
R650 2.7 1/4W
R651 240K
R652 10K
C616 1000P
C617 0.1µ
C618 47µ/16V
C619 3.3/25V
C620 3.3/25V
C621 3.3µ/25V
C622 0.1µ
C623 0.1µ
C624 0.1µ
C625 0.1µ
C627 0.1µ
L702
L703
C802 0.1µ
CN6
1 PW1
2 PW2
3 PW3
4 +12V
5 +5V
6 GND
7 5Vref
8 PC1
9 PC2
10 PC3
11 PPOS.A
12 PPOS.B
To PAN MOTOR
CN7
1 TW1
2 TW2
3 TW3
4 +12V
5 +5V
6 GND
7 5Vref
8 TC1
9 TC2
10 TC3
11 TPOS.A
12 TPOS.B
To TILT MOTOR
To +10V/+5V REG BOARD · · · CN3
CN8
1 MOTOR POWER
2 MOTOR POWER
3 POWER GND
4 POWER GND
CN9
1 FAN POWER
2 GND
To FAN MOTOR
4
5
6
7

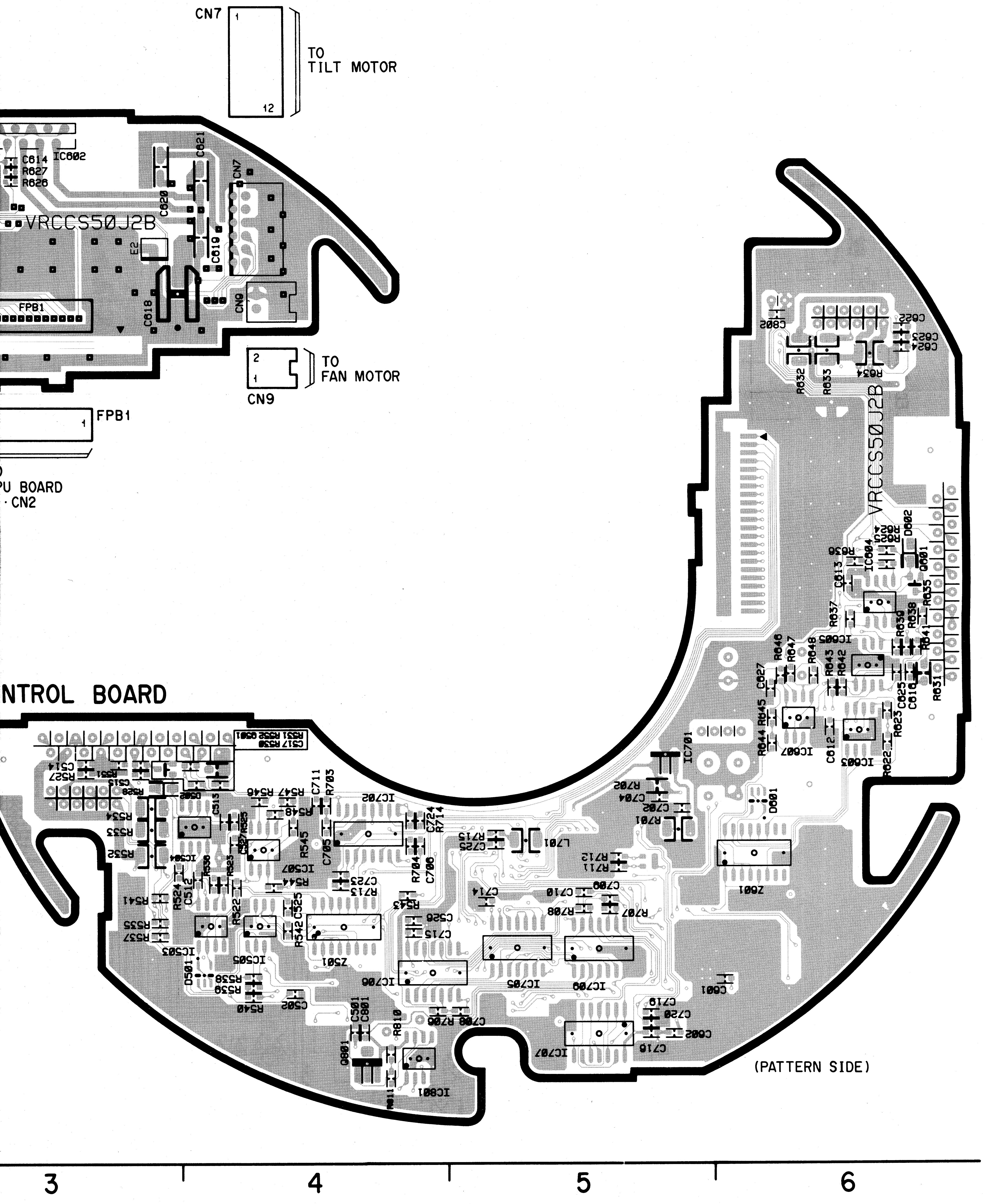
CONDUCTOR VIEW OF CONTROL

< Index>
CONTROL BOARD

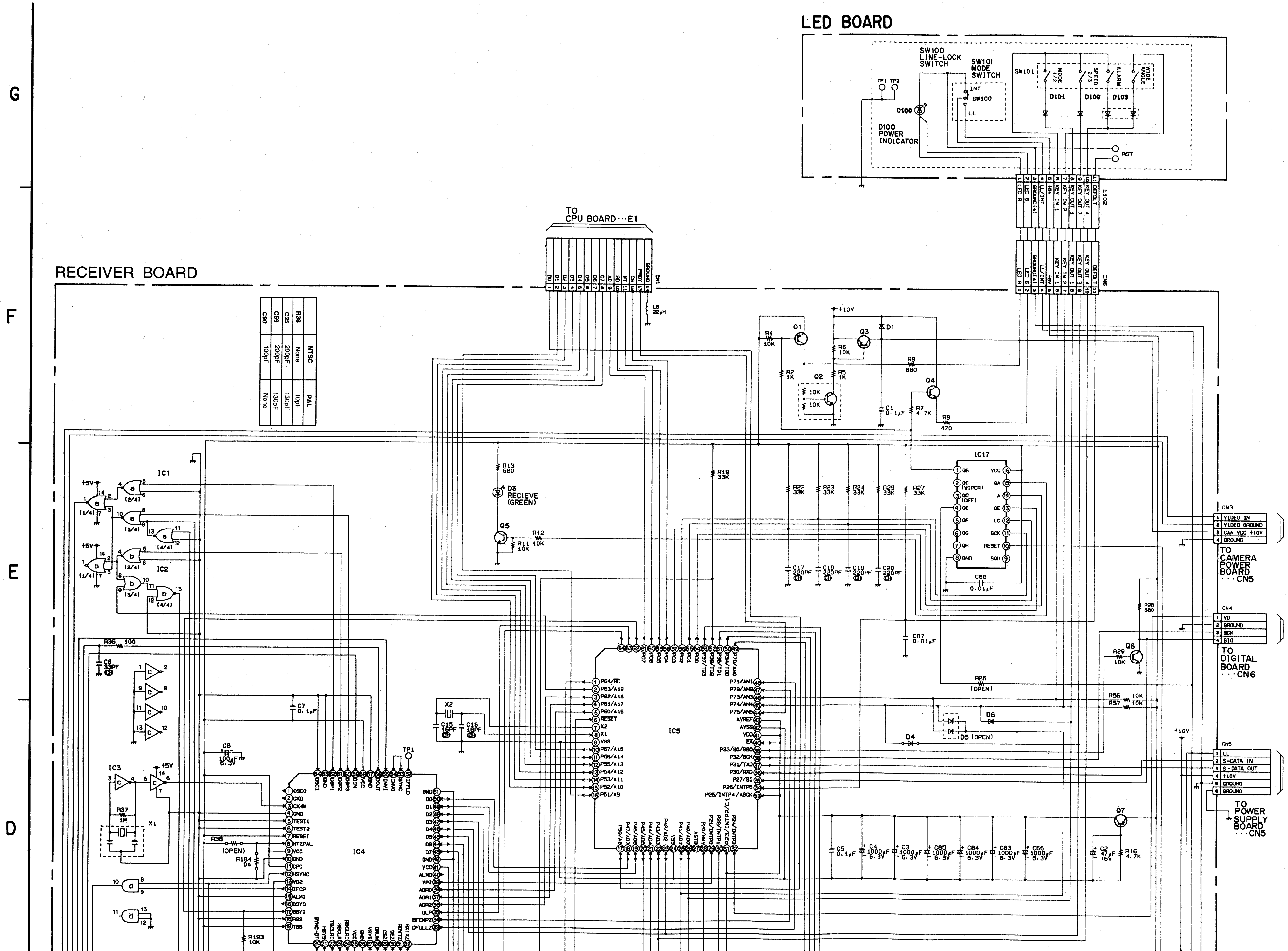
IC501	B1
IC502	B2
IC503	A4
IC504	B4
IC505	A4
IC506	C1
IC507	B4
IC601	C1
IC602	D3
IC603	B6
IC604	C6
IC605	B6
IC606	C1
IC607	B6
IC701	B5
IC702	B4
IC703	C2
IC704	C2
IC705	A5
IC706	A4
IC707	A5
IC708	C1
IC709	A5
IC801	A4
Q501	B4
Q601	C6
Q801	A4
D501	A4
D502	B4
D601	B6
D602	C6


CONTROL BOARD
CONTROL BOARD
D
C
B
A
1
2
3
(COMPONENT SIDE)
VRCCS50J2B
FPB1
22
1
TO
CPU BOARD
··· CN2
CN8
4
1
TO
+10V/+5V REG
BOARD
··· CN3
CN6
1
12
TO
PAN
MOTOR
IC501
IC502
IC506
IC601
IC602
IC606
IC703
IC704
IC708
C507
C509
C510
C511
C518
C519
C520
C521
C522
C523
C524
C529
C516
C503
C603
C604
C607
C609
C610
C611
C605
C608
C614
C615
C617
C618
C620
C629
C701
C703
C707
C712
C713
C717
C718
C721
C722
C626
R502
R501
R503
R510
R511
R513
R526
R529
R549
R550
R601
R602
R603
R604
R605
R606
R608
R609
R610
R611
R612
R613
R614
R615
R616
R617
R618
R619
R620
R621
R626
R627
R628
R629
R630
R640
R649
R650
R651
R652
R653
R705
R801
R802
R803
R806
R807
R808
TH801
Z502
Z602
L702
L703
E1
E2
CN6
CN8
R527
C514
R551
C515
R528
R532
R533
R534
R535
R537
R541
R524

EW OF CONTROL BOARD

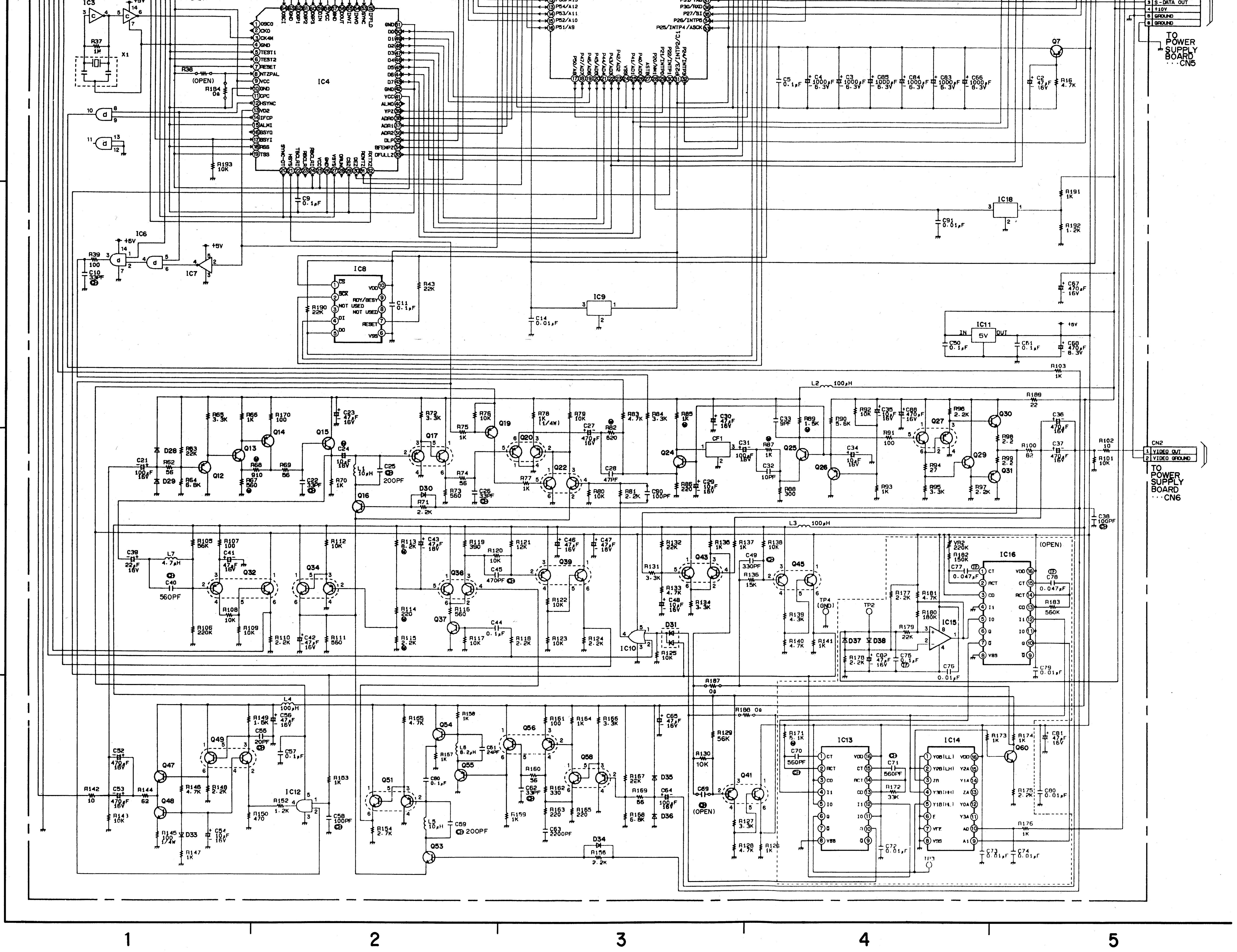

CN7
1
12
TO
TILT MOTOR
C614
R627
R626
IC602
C621
CN7
C620
VRCCS50J2B
E2
C619
FPB1
C618
CN9
2
1
TO
FAN MOTOR
CN9
FPB1
1
U BOARD
· CN2
NTROL BOARD
C517 R530 R531 R552 Q501
C514
R527
R551
C515
R528
D502
C513
R534
R533
R532
IC504
R536
R523
R525
C527
R546
R547
R548
C711
R703
IC702
R545
IC507
R544
C705
C724
R714
R541
R524
C512
R522
C525
R542
C723
R713
R704
C706
R543
C526
C715
R535
R537
IC503
Z501
IC505
D501
R538
R539
R540
C502
IC706
C501
C801
R810
C708
R706
Q801
IC801
R811
C725
R715
L701
C714
R712
R711
C710
R708
C709
R707
IC705
IC709
C719
C720
C716
C602
IC707
C601
R702
C704
C702
R701
IC701
D601
Z601
C802
C622
C623
C624
R632
R633
R634
VRCCS50J2B
D602
R624
R625
R636
IC604
C613
Q601
R635
R637
R638
R639
R641
IC605
R646
R647
R648
R643
R642
R631
C627
C625
C616
R645
R644
IC607
C612
R623
IC603
R622
(PATTERN SIDE)
3
4
5
6

SCHEMATIC DIAGRAM OF R


G
F
E
D
LED BOARD
SW100
LINE-LOCK
SWITCH
SW101
MODE
SWITCH
SW101
MODE 1/2
SPEED 2/3
ALARM
WIDE ANGLE
TP1
TP2
INT
SW100
LL
D100
D100
POWER
INDICATOR
D101
D102
D103
RST
E102
LED R
LED G
GROUND(4)
LL/INT
+9V
KEY IN 1
KEY IN 2
KEY OUT 1
KEY OUT 3
KEY OUT 4
DEFOLT
TO
CPU BOARD···E1
RECEIVER BOARD
CN1
D0
D1
D2
D3
D4
D5
D6
D7
AD
RD
WT
CS
PRDY
GROUND
L8
22μH
CN6
+10V
Q1
Q2
Q3
Q4
D1
R1
10K
R2
1K
R5
1K
R6
10K
R7
4.7K
R8
470
R9
680
C1
0.1μF
IC1
IC2
IC3
+5V
R13
680
D3
RECIEVE
(GREEN)
Q5
R11
10K
R12
10K
R19
33K
R22
33K
R23
33K
R24
33K
R25
33K
R27
33K
C17
220PF
C18
220PF
C19
220PF
C20
220PF
IC17
QB
QC
(WIPER)
QD
(DEF)
QE
QF
QG
QH
GND
VCC
QA
A
DE
LC
SCK
RESET
SQH
C86
0.01μF
C87
0.01μF
CN3
VIDEO IN
VIDEO GROUND
CAM VCC +10V
GROUND
TO
CAMERA
POWER
BOARD
···CN5
CN4
VD
GROUND
SCK
SIO
TO
DIGITAL
BOARD
···CN6
R28
680
Q6
R29
10K
R26
(OPEN)
R56
10K
R57
10K
D4
D5 (OPEN)
D6
+10V
CN5
LL
S-DATA IN
S-DATA OUT
+10V
GROUND
GROUND
TO
POWER
SUPPLY
BOARD
···CN5
Q7
C2
47μF
16V
R16
4.7K
C5
0.1μF
C4
1000μF
6.3V
C3
1000μF
6.3V
C85
1000μF
6.3V
C84
1000μF
6.3V
C83
1000μF
6.3V
C66
1000μF
6.3V
IC5
P64/RD
P63/A19
P62/A18
P61/A17
P60/A16
RESET
X2
X1
VSS
P57/A15
P56/A14
P55/A13
P54/A12
P53/A11
P52/A10
P51/A9
P71/AN1
P72/AN2
P73/AN3
P74/AN4
P75/AN5
AVREF
AVSS
VDD
EA
P33/SO/SB0
P32/SCK
P31/TXD
P30/RXD
P27/SI
P26/INTP6
P25/INTP4/ASCK
X2
C15
16PF
C16
16PF
R36
100
C6
33PF
C7
0.1μF
C8
100μF
6.3V
TP1
R37
1M
X1
R38
(OPEN)
R184
0Ω
R193
10K
IC4
OSC0
CKO
CK4M
GND
TEST1
TEST2
RESET
NTZPAL
VCC
GND
CPC
HSYNC
VD2
IFCP
ALMI
BSYQ
BSYI
RSS
TSS
GND
D0
D1
D2
D3
D4
D5
D6
D7
GND
VCC
ALMO
YPZ
ADR0
ADR1
ADR2
DLP
BFEMPZ
DFULLZ

	NTSC	PAL
R38	None	10pF
C25	200pF	130pF
C59	200pF	130pF
C90	100pF	None

DIAGRAM OF RECEIVER BOARD


D
C
B
A
1
2
3
4
5
IC3
IC4
IC6
IC7
IC8
IC9
IC10
IC11
IC12
IC13
IC14
IC15
IC16
IC18
X1
R37 1M
R38 (OPEN)
R184 0Ω
R193 10K
C9 0.1μF
R39 100
C10 33PF
+5V
OSCO
CKO
CK4M
GND
TEST1
TEST2
RESET
NTZPAL
VCC
GND
CPC
HSYNC
VD2
IFCP
ALMI
BSYO
BSYI
RSS
TSS
D0
D1
D2
D3
D4
D5
D6
D7
GND
VCC
ALMO
YPZ
ADR0
ADR1
ADR2
DLP
BFEMPZ
DFULLZ
P54/A12
P53/A11
P52/A10
P51/A9
P30/RXD
P27/SI
P26/INTP6
P25/INTP4/ASCK
CS
SCK
DI
DO
VDD
RDY/BESY
NOT USED
RESET
VSS
R190 22K
C11 0.1μF
R43 22K
C14 0.01μF
C5 0.1μF
C4 1000μF 6.3V
C3 1000μF 6.3V
C85 1000μF 6.3V
C84 1000μF 6.3V
C83 1000μF 6.3V
C66 1000μF 6.3V
C2 47μF 16V
R16 4.7K
Q7
S-DATA OUT
+10V
GROUND
GROUND
TO POWER SUPPLY BOARD ···CN5
R191 1K
R192 1.2K
C91 0.01μF
C67 470μF 16V
IN
5V
OUT
C50 0.1μF
C51 0.1μF
C60 470μF 6.3V
+6V
R103 1K
R189 22
L2 100μH
CN2
VIDEO OUT
VIDEO GROUND
TO POWER SUPPLY BOARD ···CN6
R102 10
R101 10K
R100 82
C36 470μF 16V
C37 470μF 16V
C38 100PF
Q12
Q13
Q14
Q15
Q16
Q17
Q19
Q20
Q22
Q24
Q25
Q26
Q27
Q29
Q30
Q31
D28
D29
D30
C21 100μF 16V
R62 56
R63 22K
R64 6.8K
R65 3.3K
R66 1K
R170 100
R68 910
R67 560
R69 56
C22 33PF
C23 47μF 16V
C24 10μF 16V
R70 1K
L1 10μH
C25 200PF
R72 3.3K
R73 560
R74 56
R71 2.2K
C26 33PF
R75 1K
R76 10K
R78 1K (1/4W)
R79 10K
C27 470μF 16V
R82 620
R77 1K
R80 10K
R81 2.2K
C28 47PF
C90 100PF
R83 4.7K
R84 3.3K
R85 1K
R86 220
C29 10μF 16V
C30 47μF 16V
CF1
C31 100μF 16V
R87 1K
C32 10PF
R88 300
C33 9PF
R89 1.5K
C34 10μF 16V
R90 5.6K
R92 10K
C35 10μF 16V
C88 470μF 16V
R91 100
R93 1K
R94 27
R95 3.3K
R96 2.2K
R97 2.2K
R98 2.2
R99 2.2
Q32
Q34
Q36
Q37
Q39
Q43
Q45
C39 22μF 16V
L7 4.7μH
C40 560PF
R105 56K
R107 100
C41 47μF 16V
R108 10K
R106 220K
R109 10K
R110 2.2K
C42 47μF 16V
R111 560
R112 10K
R113 6.2K
C43 47μF 16V
R114 220
R115 2.2K
R116 560
R117 10K
R118 2.2K
C44 0.1μF
R119 390
R120 10K
C45 470PF
R121 12K
C46 47μF 16V
C47 47μF 16V
R122 10K
R123 10K
R124 2.2K
R125 10K
D31
R131 3.3K
R132 22K
R133 4.7K
C48 10μF 16V
R134 3.3K
R136 1K
R137 1K
R138 10K
C49 330PF
R135 15K
L3 100μH
R139 4.3K
R140 4.7K
R141 1K
TP4 (GND)
TP2
D37
D38
R177 2.2K
R181 4.7K
R180 180K
R179 22K
R178 2.2K
C92 47μF 16V
C75 0.1μF
C76 0.01μF
VR2 220K
R182 150K
C77 0.047μF
(OPEN)
C78 0.047μF
R183 560K
C79 0.01μF
CT
RCT
CD
I1
I0
Q
VSS
VDD
R187 0Ω
R188 0Ω
Q41
Q47
Q48
Q49
Q51
Q53
Q54
Q55
Q56
Q58
Q60
C52 470μF 16V
R142 10
C53 470μF 16V
R143 10K
R144 62
R145 100 1/4W
D33
R147 1K
R146 4.7K
R148 2.2K
C54 10μF 16V
R149 1.6K
C55 20PF
C56 47μF 16V
L4 100μH
C57 0.1μF
R150 470
R152 1.2K
C58 100PF
R153 1K
R154 2.7K
R155 4.7K
R157 1K
R158 1K
C80 0.1μF
L6 8.2μH
C81 24PF
L5 10μH
C59 200PF
R159 1K
R160 36
C62 33PF
R161 100
R162 330
R163 220
C63 2200PF
R164 1K
R165 220
R166 3.3K
R167 22K
R168 6.8K
R169 56
C64 100μF 16V
C65 47μF 16V
D35
D36
D34
R156 2.2K
R129 56K
R130 10K
C69 (OPEN)
R127 3.3K
R128 4.7K
R126 1K
R171 5.1K
C70 560PF
C71 560PF
R172 33K
C72 0.01μF
YOB(L)
YPB(L)
ZR
Y3B(H)
Y1B(H)
E
VEE
Y2A
Y1A
ZA
Y0A
Y3A
A0
A1
TP3
R173 1K
R174 1K
C81 47μF 16V
R175 2.2K
C80 0.01μF
R176 1K
C73 0.01μF
C74 0.01μF

CONDUCTOR VIEW OF RECEIVER

< Index>
SCHEMATIC DIAGRAM
RECEIVER BOARD

IC1	E1
IC2	E1
IC3	D1,E1
IC4	D2
IC5	D3
IC6	C1,D1
IC7	C1
IC8	C2
IC9	C3
IC10	B3
IC11	C4
IC12	A2
IC17	E4
IC18	C5
Q1	F3
Q2	F4
Q3	F4
Q4	F4
Q5	E2
Q6	E5
Q7	D5
Q12	B1
Q13	B1
Q14	B2
Q15	B2
Q16	B2
Q17	B2
Q19	B2
Q20	B3
Q22	B3
Q24	B3
Q25	B4
Q26	B4
Q27	B4
Q29	B4
Q30	C5
Q31	B5
Q32	B2
Q34	B2
Q36	B2
Q37	B2
Q39	B3
Q41	A4
Q43	B3
Q45	B4
Q47	A1
Q48	A1
Q49	A1
Q51	A2
Q53	A2
Q54	A2
Q55	A2
Q56	A3
Q58	A3
D1	F4
D3	E2
D4	D4
D6	D4
D28	B1
D29	B1
D30	B2
D31	B3
D33	A1
D34	A3
D35	A3
D36	A3

< Index>
LED SWITCH BOARD

D100	G4
D101	G4
D102	G5
D103	G5

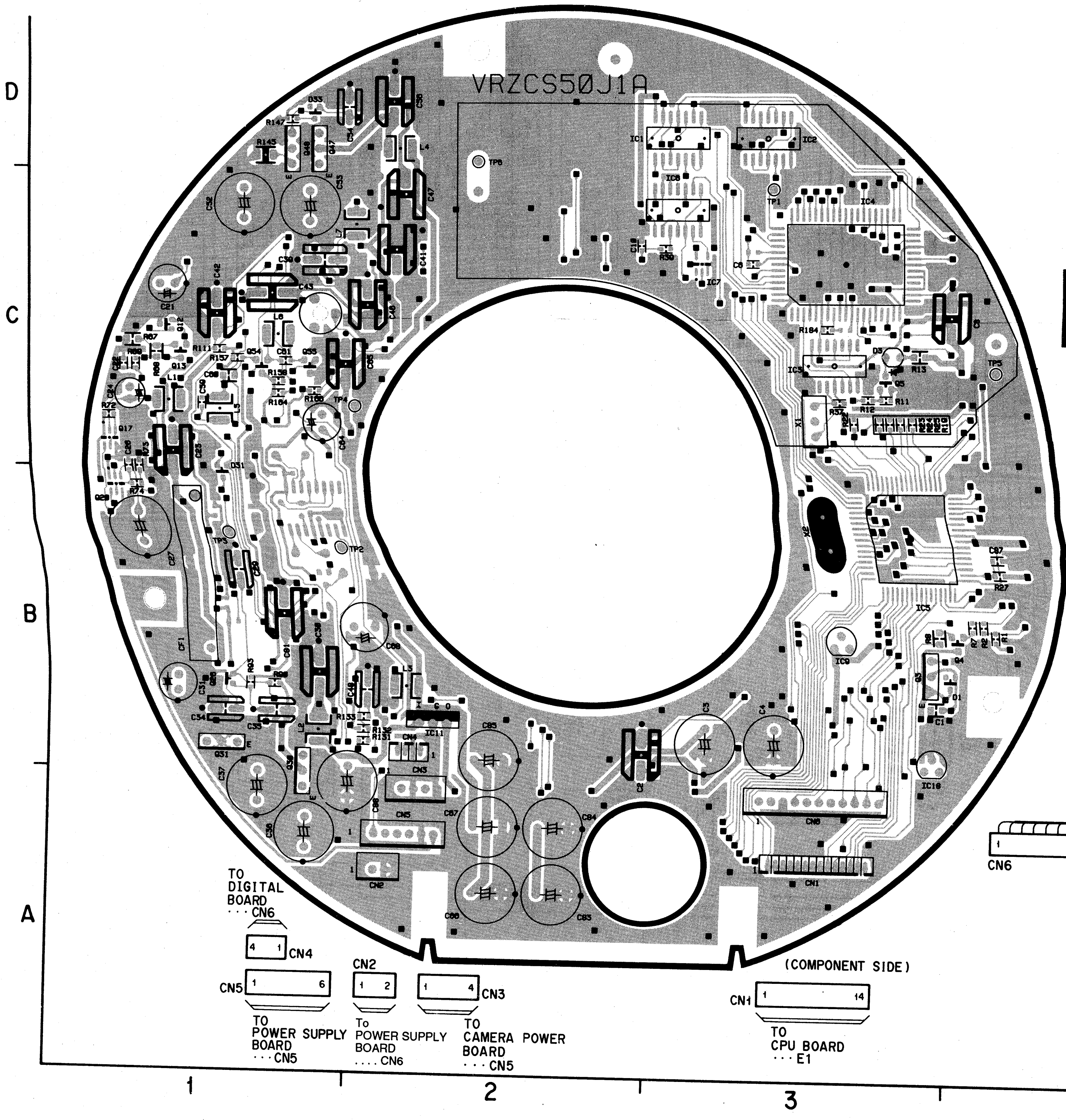
< Index>
CONDUCTOR VIEW
RECEIVER BOARD

IC1	D3
IC2	D3
IC3	C3
IC4	C3
IC5	B3
IC6	C3
IC7	C3
IC8	C5
IC9	B3
IC10	C8
IC11	B2
IC12	D7
IC17	C5
IC18	B3
Q1	B5
Q2	B5
Q3	B3
Q4	B3
Q5	C3
Q6	B6
Q7	B6
Q12	C1
Q13	C1
Q14	C8
Q15	C8
Q16	C8
Q17	C1
Q19	C8
Q20	B1
Q22	C8
Q24	B8
Q25	B7
Q26	B1
Q27	B7
Q29	B8
Q30	A1
Q31	B1
Q32	C7
Q34	C8
Q36	C7
Q37	C7
Q39	C7
Q41	B7
Q43	B7
Q45	B8
Q47	D1
Q48	D1
Q49	D7
Q51	C7
Q53	C8
Q54	C1
Q55	C1
Q56	C7
Q58	C7
D1	B3
D3	C3
D4	B6
D6	B6
D28	C8
D29	C8
D30	C8
D31	B1
D33	D1
D34	C8
D35	C7
D36	C7

< Index>
LED SWITCH BOARD

D100	B4
D101	C4
D102	C4
D103	C5

RECEIVER BOARD


VRZCS50J1A
D
C
B
A
1
2
3
TO DIGITAL BOARD ···CN6
CN4
CN5
CN2
CN3
TO POWER SUPPLY BOARD ···CN5
To POWER SUPPLY BOARD CN6
TO CAMERA POWER BOARD ···CN5
(COMPONENT SIDE)
CN1
TO CPU BOARD ···E1
CN6

CONDUCTOR VIEW OF RECEIVE

< Index>
SCHEMATIC DIAGRAM
RECEIVER BOARD

IC1	E1
IC2	E1
IC3	D1,E1
IC4	D2
IC5	D3
IC6	C1,D1
IC7	C1
IC8	C2
IC9	C3
IC10	B3
IC11	C4
IC12	A2
IC17	E4
IC18	C5
Q1	F3
Q2	F4
Q3	F4
Q4	F4
Q5	E2
Q6	E5
Q7	D5
Q12	B1
Q13	B1
Q14	B2
Q15	B2
Q16	B2
Q17	B2
Q19	B2
Q20	B3
Q22	B3
Q24	B3
Q25	B4
Q26	B4
Q27	B4
Q29	B4
Q30	C5
Q31	B5
Q32	B2
Q34	B2
Q36	B2
Q37	B2
Q39	B3
Q41	A4
Q43	B3
Q45	B4
Q47	A1
Q48	A1
Q49	A1
Q51	A2
Q53	A2
Q54	A2
Q55	A2
Q56	A3
Q58	A3
D1	F4
D3	E2
D4	D4
D6	D4
D28	B1
D29	B1
D30	B2
D31	B3
D33	A1
D34	A3
D35	A3
D36	A3

< Index>
LED SWITCH BOARD

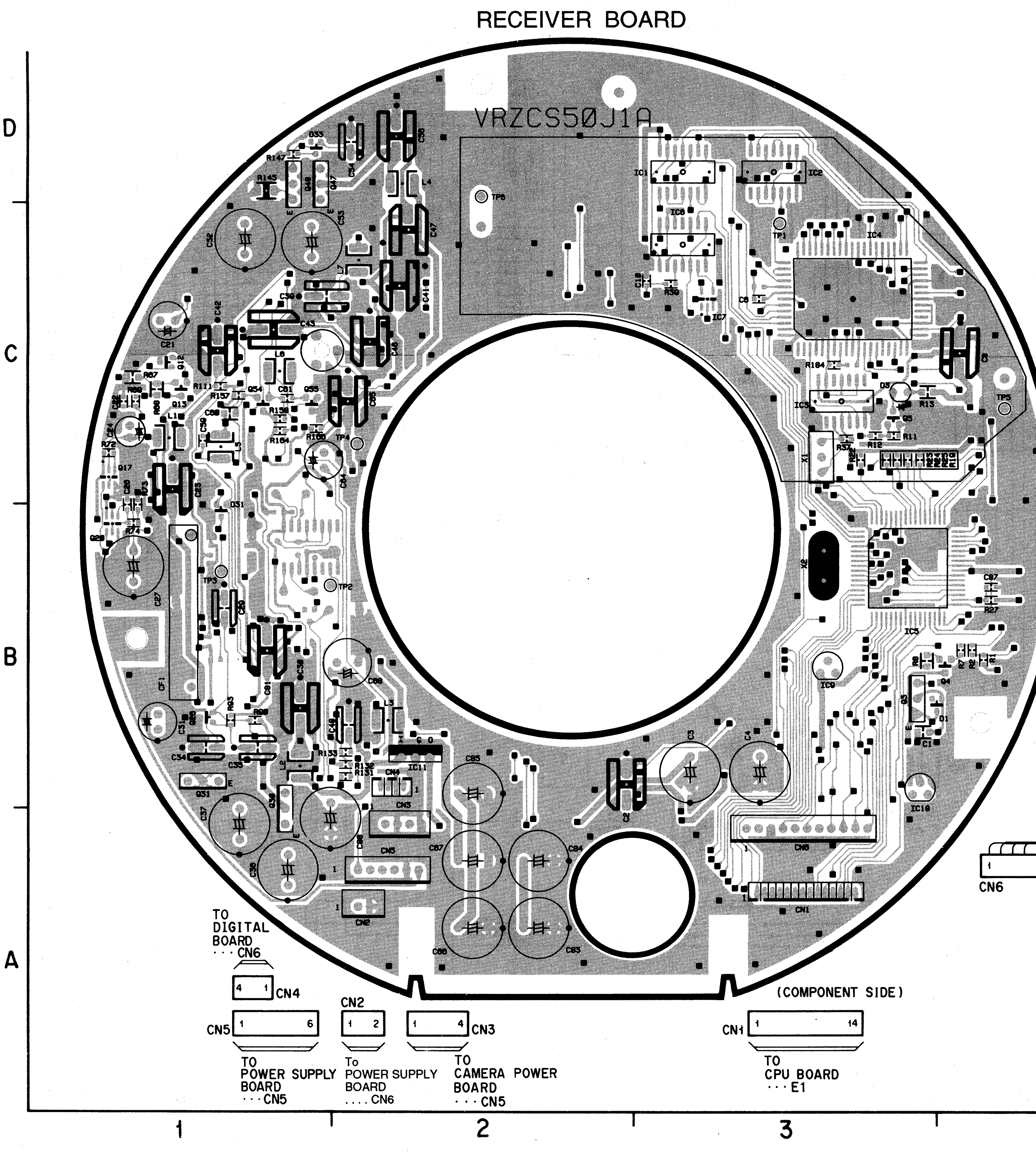
D100	G4
D101	G4
D102	G5
D103	G5

< Index>
CONDUCTOR VIEW
RECEIVER BOARD

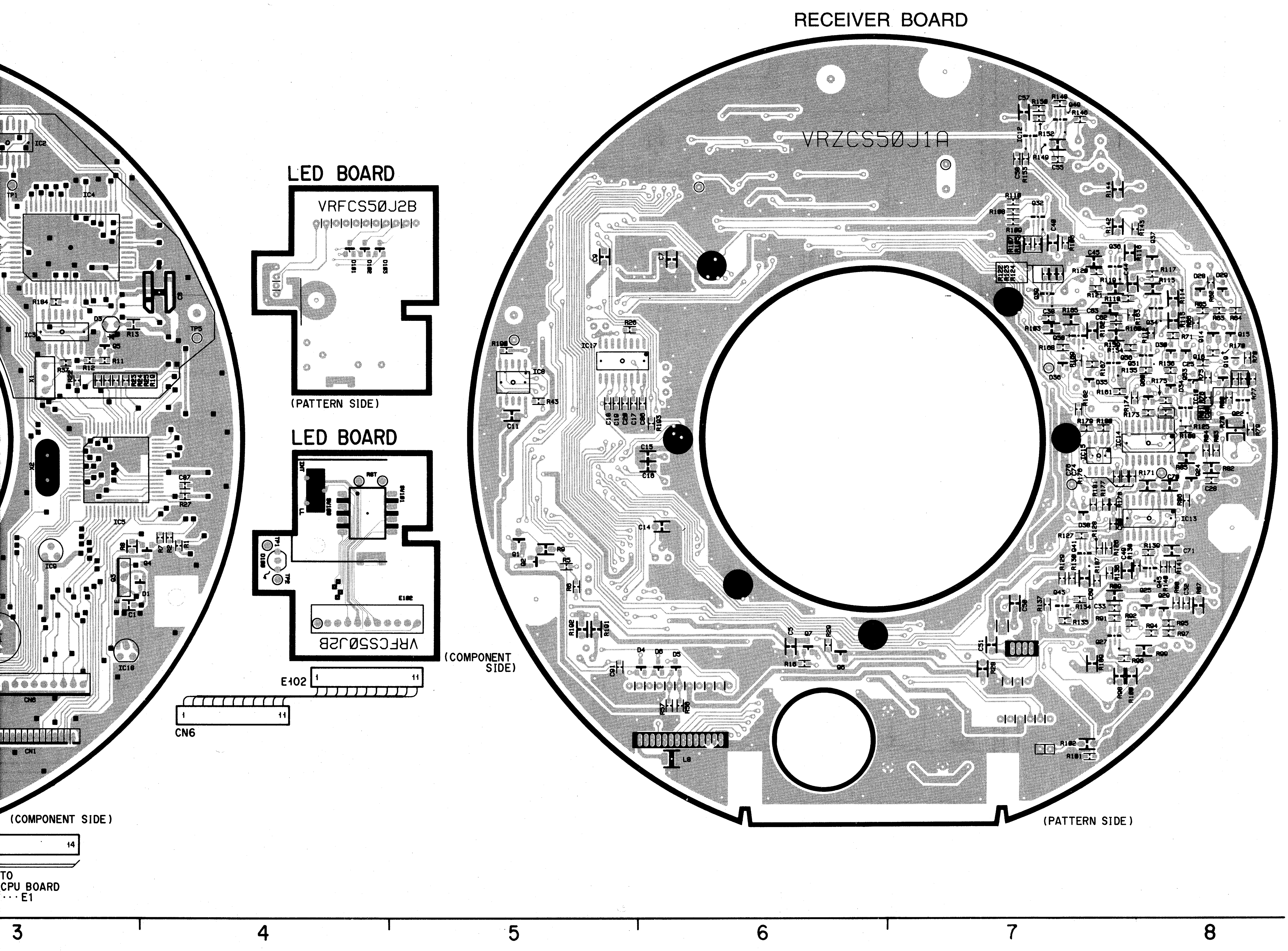
IC1	D3
IC2	D3
IC3	C3
IC4	C3
IC5	B3
IC6	C3
IC7	C3
IC8	C5
IC9	B3
IC10	C8
IC11	B2
IC12	D7
IC17	C5
IC18	B3
Q1	B5
Q2	B5
Q3	B3
Q4	B3
Q5	C3
Q6	B6
Q7	B6
Q12	C1
Q13	C1
Q14	C8
Q15	C8
Q16	C8
Q17	C1
Q19	C8
Q20	B1
Q22	C8
Q24	B8
Q25	B7
Q26	B1
Q27	B7
Q29	B8
Q30	A1
Q31	B1
Q32	C7
Q34	C8
Q36	C7
Q37	C7
Q39	C7
Q41	B7
Q43	B7
Q45	B8
Q47	D1
Q48	D1
Q49	D7
Q51	C7
Q53	C8
Q54	C1
Q55	C1
Q56	C7
Q58	C7
D1	B3
D3	C3
D4	B6
D6	B6
D28	C8
D29	C8
D30	C8
D31	B1
D33	D1
D34	C8
D35	C7
D36	C7

< Index>
LED SWITCH BOARD

D100	B4
D101	C4
D102	C4
D103	C5

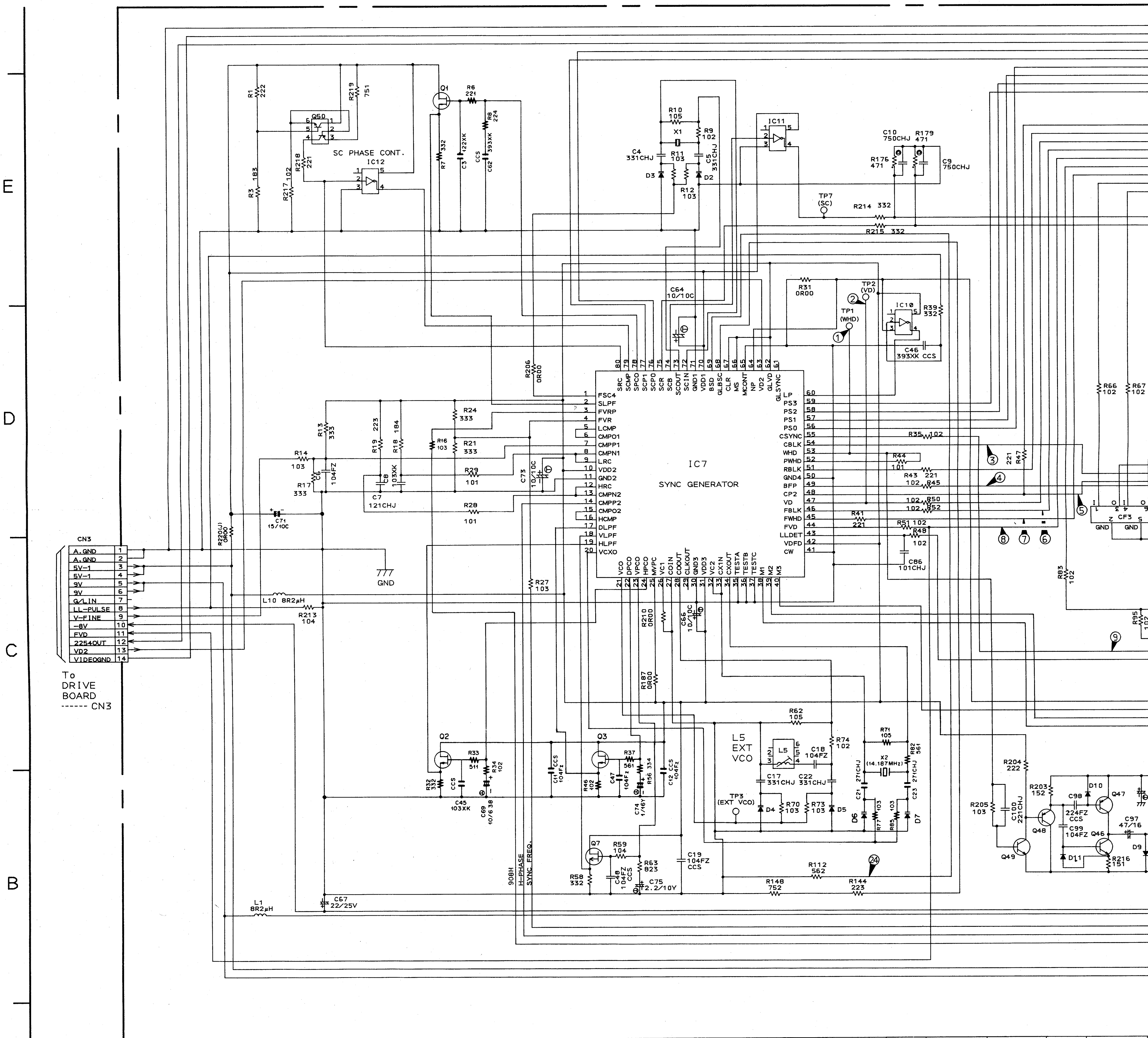

RECEIVER BOARD
VRZCS50J1A
D
C
B
A
1
2
3
TO DIGITAL BOARD ··· CN6
CN4
CN5
CN2
CN3
CN1
CN6
TO POWER SUPPLY BOARD ··· CN5
To POWER SUPPLY BOARD CN6
TO CAMERA POWER BOARD ··· CN5
(COMPONENT SIDE)
TO CPU BOARD ··· E1
IC1
IC2
IC4
IC5
IC10
IC11
X1
X2
TP1
TP2
TP3
TP5
TP6

EW OF RECEIVER BOARD


RECEIVER BOARD
VRZCS50J1A
(PATTERN SIDE)
LED BOARD
VRFCS50J2B
(PATTERN SIDE)
LED BOARD
VRFCS50J2B
(COMPONENT SIDE)
E102
CN6
(COMPONENT SIDE)
TO
CPU BOARD
···E1
3
4
5
6
7
8

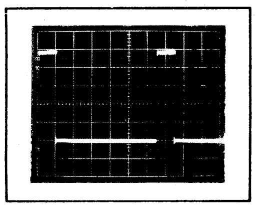
SCHEMATIC DIAGRAM OF SYNC/EN

SYNC/ENCODER BOARD

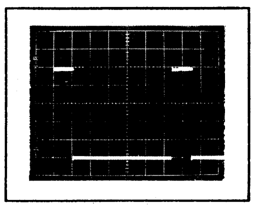

CN3
A.GND
A.GND
5V-1
5V-1
9V
9V
G/LIN
LL-PULSE
V-FINE
-8V
FVD
2254OUT
VD2
VIDEOGND
To
DRIVE
BOARD
------ CN3
IC7
SYNC GENERATOR
SC PHASE CONT.
IC12
IC11
IC10
Q50
Q1
Q2
Q3
Q7
L5
EXT
VCO
TP3
(EXT VCO)
TP1
(WHD)
TP2
(VD)
TP7
(SC)
GND
908H
H-PHASE
SYNC FREQ.
CF3
E
D
C
B
A

	NTSC	PAL		NTSC	PAL		NTSC	PAL		NTSC	PAL		NTSC	PAL		NTSC
IC7	MN73069LBM2	MN73093LBX	**R7**	None	3.2Ω	**R46**	None	1Ω	**R211**	1.1kΩ	None	**C21**	None	270pF	**C69**	6.3V
IC10	None	YWTC4S69F	**R8**	None	220kΩ	**R71**	None	1MΩ	**R210,221**	0Ω	None	**C23**	None	270pF	**C71**	15μF 10V
Q1	None	2SK853	**R9**	None	1kΩ	**R77**	None	10kΩ	**C1**	None	0.1μF	**C43**	None	0.1μF	**C72**	1μF 16V
Q2,3	None	2SK662-PQR	**R15,16**	None	10kΩ	**R82**	None	390Ω	**C2**	None	12pF	**C45**	None	0.01μF	**X1**	YWDX14R318
Q50	None	XP4601	**R32**	None	3.3kΩ	**R85**	None	10kΩ	**C3**	None	1200pF	**C46**	None	0.039μF	**X2**	None
R4	None	8.2kΩ	**R33**	None	510Ω	**R196**	None	12kΩ	**C9**	75pF	91pF	**C47**	None	0.1μF	**CF6**	YWNL453SR6
R6	None	220Ω	**R44**	None	100Ω	**R212**	None	2.7kΩ	**C11,12**	None	0.1μF	**C62**	0.039μF	None		

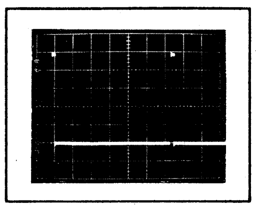
1. 10μsec/DIV,1V/DIV



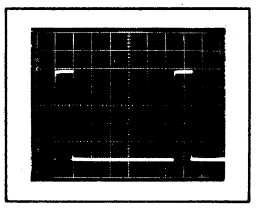
3. 10μsec/DIV,1V/DIV



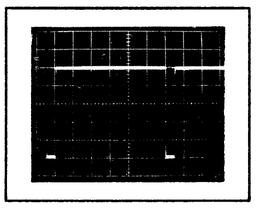
5. 10μsec/DIV,1V/DIV



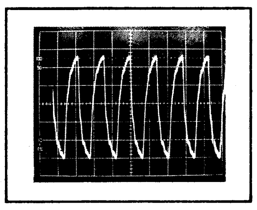
7. 10μsec/DIV,1V/DIV



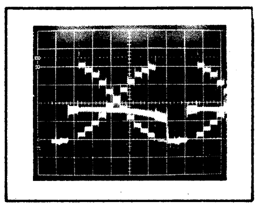
9. 10μsec/DIV,1V/DIV



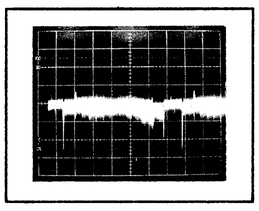
11. 0.2μsec/DIV,0.1V/DIV



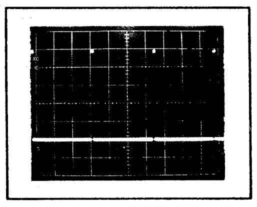
13. 10μsec/DIV,0.1V/DIV



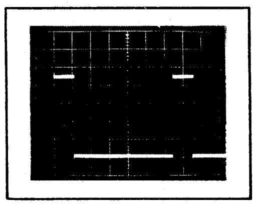
15. 10μsec/DIV,20mV/DIV



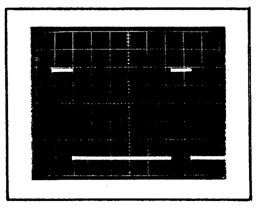
2. 5msec/DIV,1V/DIV



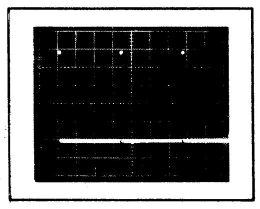
4. 10μsec/DIV,1V/DIV



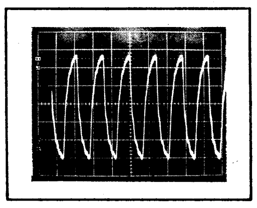
6. 10μsec/DIV,1V/DIV



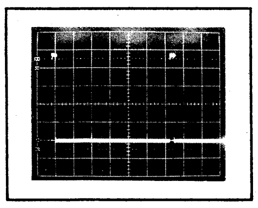
8. 5msec/DIV,1V/DIV



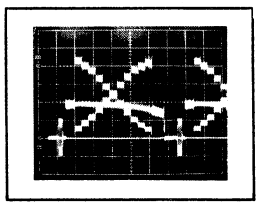
10. 0.2μsec/DIV,0.1V/DIV



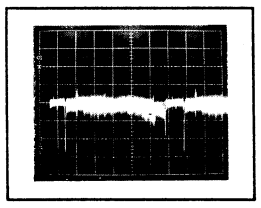
12. 10μsec/DIV,1V/DIV



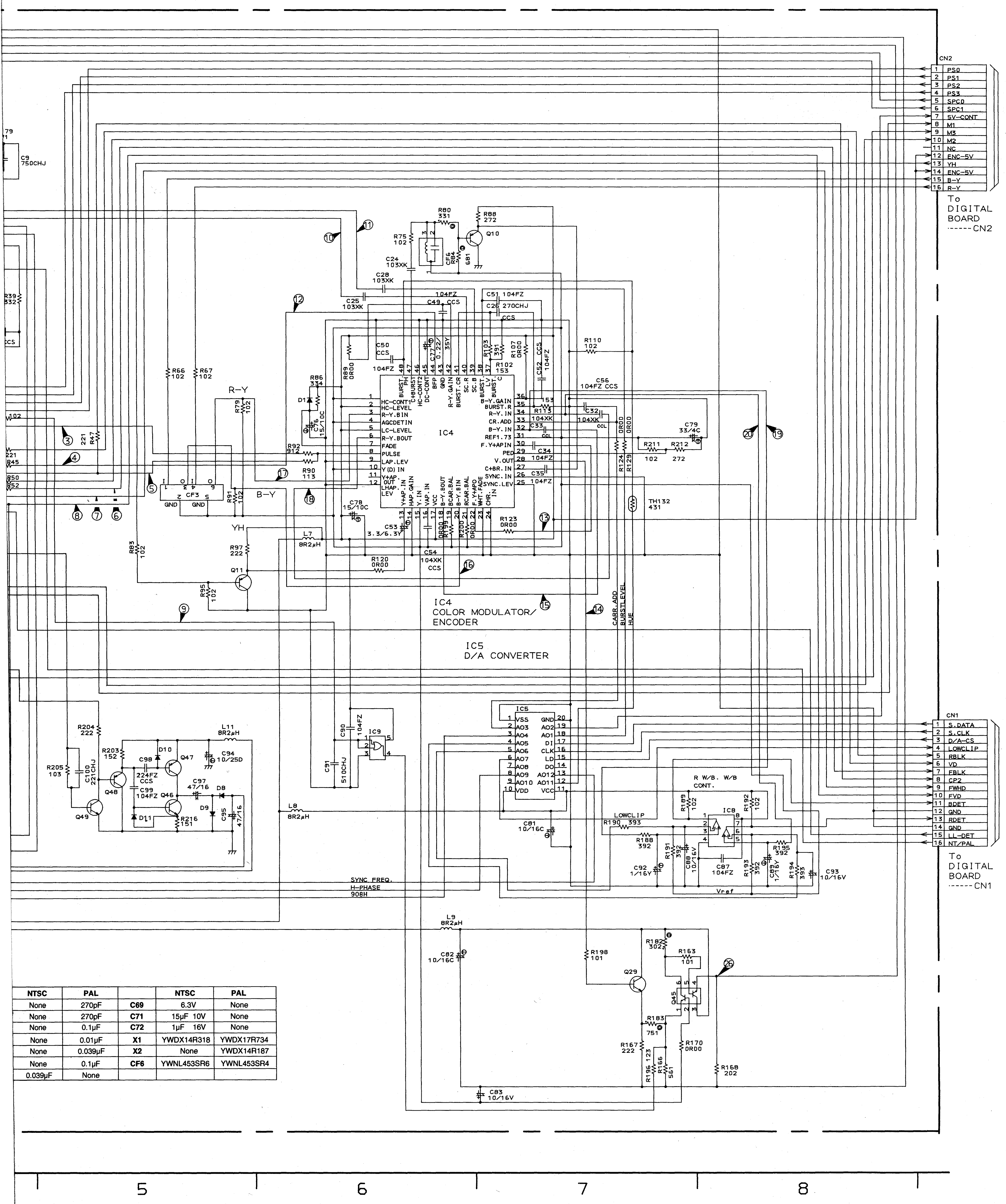
14. 10μsec/DIV,0.2V/DIV



16. 10μsec/DIV,20mV/DIV

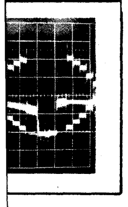


RAM OF SYNC/ENCODER BOARD

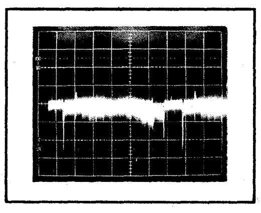

IC4
COLOR MODULATOR/
ENCODER
IC5
D/A CONVERTER
IC8
IC9
CF3
CF6
Q10
Q11
Q29
Q45
Q46
Q47
Q48
Q49
R-Y
B-Y
YH
CARR.ADD
BURSTLEVEL
HUE
SYNC FREQ.
H-PHASE
908H
LOWCLIP
R W/B. W/B
CONT.
Vref
TH132
431
1 HC-CONT1
2 HC-LEVEL
3 R-Y.BIN
4 AGCDETIN
5 LC-LEVEL
6 R-Y.BOUT
7 FADE
8 PULSE
9 LAP.LEV
10 Y(D) IN
11 Y+AP. OUT
12 LHAP. LEV
13 Y+AP.IN
14 HAP.GAIN
15 Y.IN
16 VAP.IN
17 VCC
18 B-Y.BOUT
19 BCAR.BAL
20 B-Y.BIN
21 RCAR.BAL
22 F.Y+APO
23 WHT.FADE
24 CHR. IN
25 SYNC.LEV
26 SYNC. IN
27 C+BR. IN
28 V.OUT
29 PED
30 F.Y+APIN
31 REF1.73
32 B-Y. IN
33 CR.ADD
34 R-Y. IN
35 BURST.R
36 B-Y.GAIN
37 BURST. C
38 BURST. LV
39 SC.B
40 SC.R
41 BURST.CR
42 R-Y.GAIN
43 GND
44 BFP
45 DC-CONT
46 HC-CONT2
47 C+BURST
48 BURST. PH
1 VSS
2 AO3
3 AO4
4 AO5
5 AO6
6 AO7
7 AO8
8 AO9
9 AO10
10 VDD
11 VCC
12 AO11
13 AO12
14 DO
15 LD
16 CLK
17 DI
18 AO1
19 AO2
20 GND
CN2
1 PS0
2 PS1
3 PS2
4 PS3
5 SPC0
6 SPC1
7 5V-CONT
8 M1
9 M3
10 M2
11 NC
12 ENC-5V
13 YH
14 ENC-5V
15 B-Y
16 R-Y
To
DIGITAL
BOARD
------CN2
CN1
1 S.DATA
2 S.CLK
3 D/A-CS
4 LOWCLIP
5 RBLK
6 VD
7 FBLK
8 CP2
9 FWHD
10 FVD
11 BDET
12 GND
13 RDET
14 GND
15 LL-DET
16 NT/PAL
To
DIGITAL
BOARD
------CN1
C9 750CHJ
R39 332
R66 102
R67 102
R79 102
R47 221
R75 102
R80 331
R88 272
R84 681
C24 103XK
C28 103XK
C25 103XK
C49 CCS 104FZ
C51 104FZ
C26 270CHJ
C50 CCS 104FZ
C77 0.22/35Y
R103 391
R107 0R00
R102 153
C52 CCS 104FZ
R110 102
C56 104FZ CCS
R86 334
D1
C76 15/10C
R89 0R00
R113 153
C32
C33
C34 104FZ
C35 104FZ
C79 33/4C
R211 102
R212 272
R124 0R00
R129 0R00
R92 912
R90 113
R91 102
R83 102
R97 222
R95 102
L7 8R2μH
C78 15/10C
C53 3.3/6.3Y
R120 0R00
R199 0R00
R200 0R00
R123 0R00
C54 104XK CCS
R204 222
R205 103
C100 221CHJ
R203 152
C98 224FZ CCS
C99 104FZ
D10
D11
R216 151
C97 47/16
D8
D9
C95 47/16
C94 10/25D
L11 8R2μH
C90 104FZ
C91 510CHJ
L8 8R2μH
C81 10/16C
R190 393
R188 392
R189 102
R192 102
R191 392
C92 1/16Y
C88 10/16V
C87 104FZ
R193 392
C89 1/16Y
R195 392
R194 393
C93 10/16V
L9 8R2μH
C82 10/16C
R198 101
R182 302
R163 101
R183 751
R167 222
R196 123
R166 561
R170 0R00
R168 202
C83 10/16V
5
6
7
8

NTSC	PAL		NTSC	PAL
None	270pF	**C69**	6.3V	None
None	270pF	**C71**	15μF 10V	None
None	0.1μF	**C72**	1μF 16V	None
None	0.01μF	**X1**	YWDX14R318	YWDX17R734
None	0.039μF	**X2**	None	YWDX14R187
None	0.1μF	**CF6**	YWNL453SR6	YWNL453SR4
0.039μF	None			

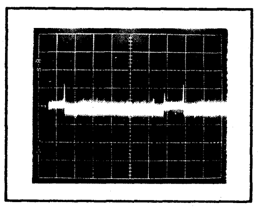
V,0.1V/DIV



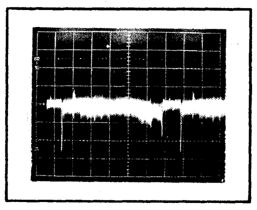
15. 10μsec/DIV,20mV/DIV



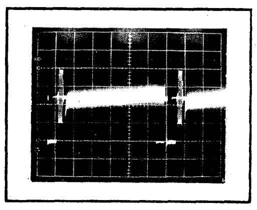
17. 10μsec/DIV,20mV/DIV



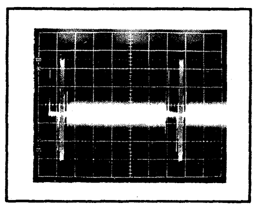
19. 10μsec/DIV,20mV/DIV



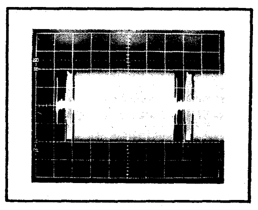
21. 10μsec/DIV,0.1V/DIV



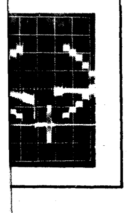
23. 10μsec/DIV,0.1V/DIV



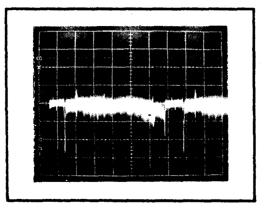
25. 10μsec/DIV,0.5V/DIV



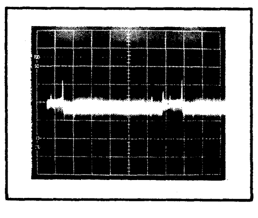
V,0.2V/DIV



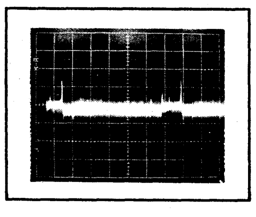
16. 10μsec/DIV,20mV/DIV



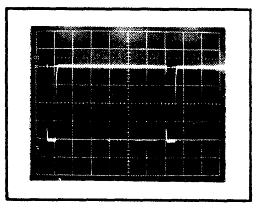
18. 10μsec/DIV,20mV/DIV



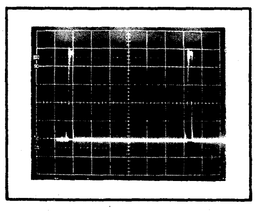
20. 10μsec/DIV,20mV/DIV



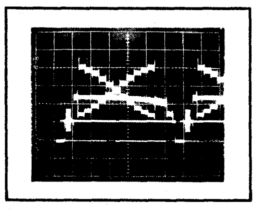
22. 10μsec/DIV,1V/DIV



24. 10μsec/DIV,1V/DIV



26. 10μsec/DIV,1V/DIV



CONDUCTOR VIEW OF SYNC/ENCODER BOARD

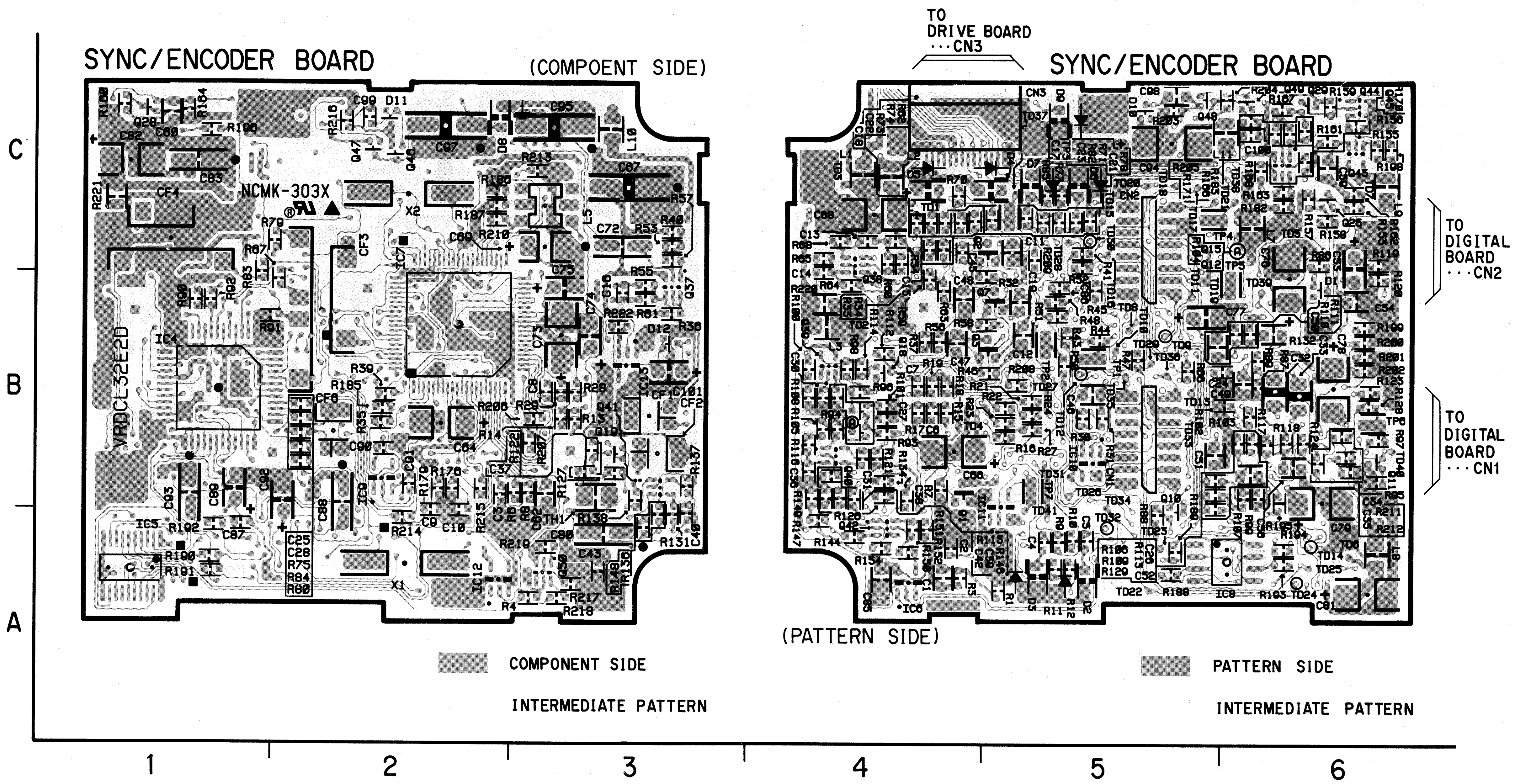
	IC4		IC4
Pin 1	1.7	Pin 25	0
2	4.8	26	0
3	2.6	27	1.7
4	1.7	28	2.0
5	4.8	29	2.1
6	0	30	1.2
7	4.7	31	1.9
8	0	32	1.7
9	0	33	1.7
10	1.7	34	0
11	0	35	2.9
12	0	36	4.8
13	0	37	2.9
14	0	38	2.4
15	1.7	39	1.7
16	1.7	40	1.7
17	4.8	41	2.9
18	3.3	42	4.8
19	1.7	43	0
20	2.6	44	0.35
21	1.7	45	2.3
22	0	46	0
23	0	47	2.4
24	0	48	1.1

	IC7		IC7		IC7		IC7
Pin 1	0	Pin 21	0	Pin 41	0	Pin 61	0.1
2	0.5	22	0	42	4.8	62	4.8
3	0	23	0	43	0.1	63	4.7
4	1.5	24	0	44	0.1	64	0
5	4.8	25	4.8	45	0.7	65	0
6	4.8	26	0	46	1.2	66	4.8
7	0.9	27	0	47	0.1	67	4.8
8	0	28	4.8	48	0.1	68	0
9	0	29	0	49	0.1	69	4.8
10	4.8	30	0	50	0	70	4.8
11	0	31	4.8	51	1.0	71	0
12	0	32	0	52	0.7	72	2.4
13	0	33	0	53	0.7	73	2.5
14	2.3	34	4.8	54	1.1	74	1.3
15	4.8	35	0	55	4.4	75	1.3
16	4.8	36	0	56	4.3	76	0
17	0	37	0	57	4.3	77	4.3
18	0.3	38	0	58	4.3	78	0
19	4.7	39	0.0	59	4.7	79	4.8
20	0	40	0	60	4.8	80	0

	IC5	IC8	IC9	IC10	IC11	IC12
Pin 1	0	0.1	4.4	0	0	0
2	0.9	1.7	4.4	0	0	0
3	1.4	1.7	0	0	0	0.6
4	1.7	0	4.3	4.8	5.0	2.9
5	1.7	0	4.8	4.8	0	5.5
6	2.2	1.7				
7	0.6	0.1				
8	0	4.8				
9	0					
10	3.8					
11	4.8					
12	1.6					
13	0.9					
14	1.8					
15	0					
16	3.3					
17	4.3					
18	2.4					
19	0					
20	0					

	B	C	E
Q2	4.7	4.8	4.8
7	0.3	0	4.8
10	1.7	0	2.3
11	0	0	2.5
29	0	8.7	1.2
46	0.8	1.7	0.3
47	9.2	1.7	8.7
48	4.1	0	2.3
49	0	4.1	0

	Pin 1	2	3	4	5	6
Q37	1.6	2.3	8.7	4.4	5.1	5.1
38	0	0.6	8.7	3.8	4.4	0.1
45	1.1	1.7	8.7	0	3.1	3.1


SYNC/ENCODER BOARD
(COMPOENT SIDE)
NCMK-303X
VRDCL32E2D
TO
DRIVE BOARD
···CN3
SYNC/ENCODER BOARD
(PATTERN SIDE)
TO
DIGITAL
BOARD
···CN2
TO
DIGITAL
BOARD
···CN1
COMPONENT SIDE
INTERMEDIATE PATTERN
PATTERN SIDE
INTERMEDIATE PATTERN
C
B
A
1
2
3
4
5
6

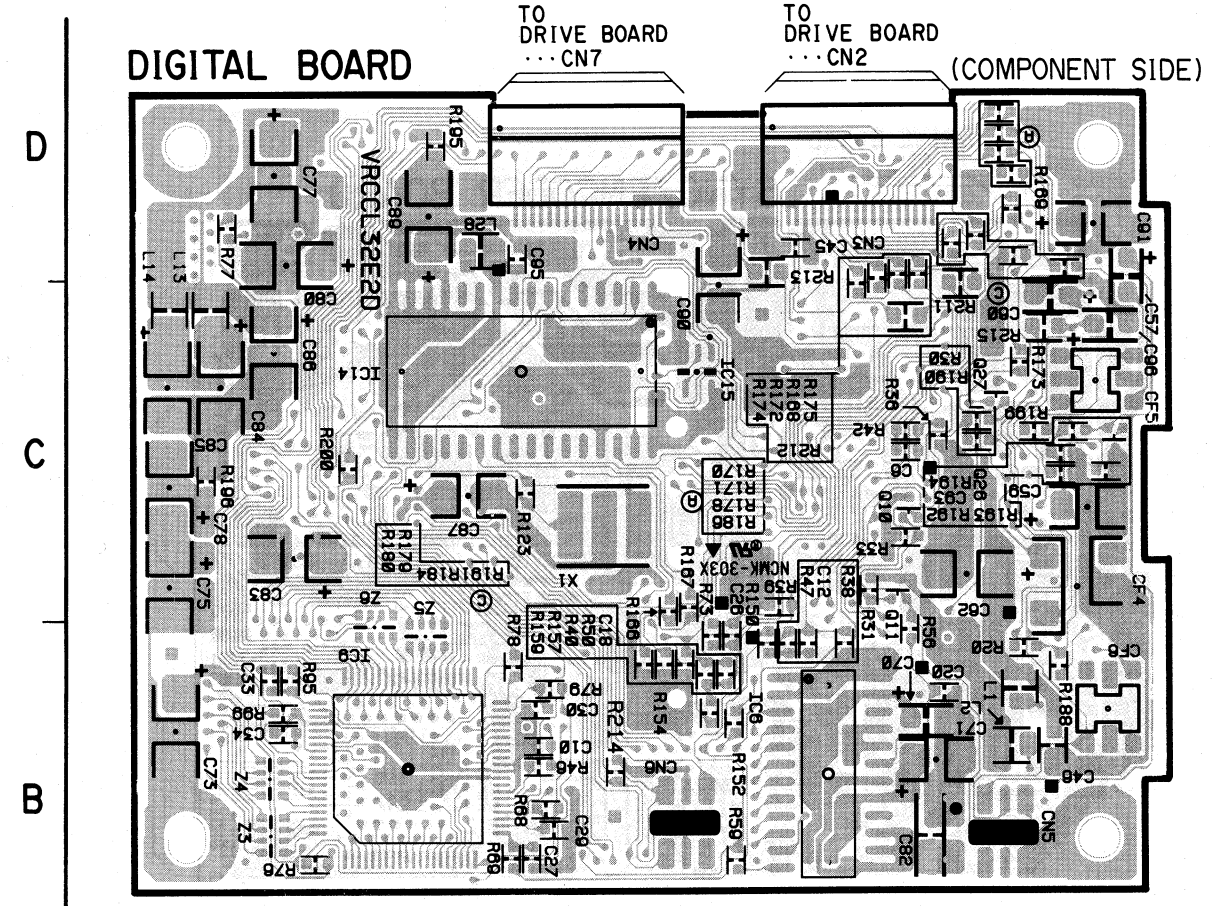
< Index>
SCHEMATIC DIAGRAM
SYNC/ENCODER BOARD

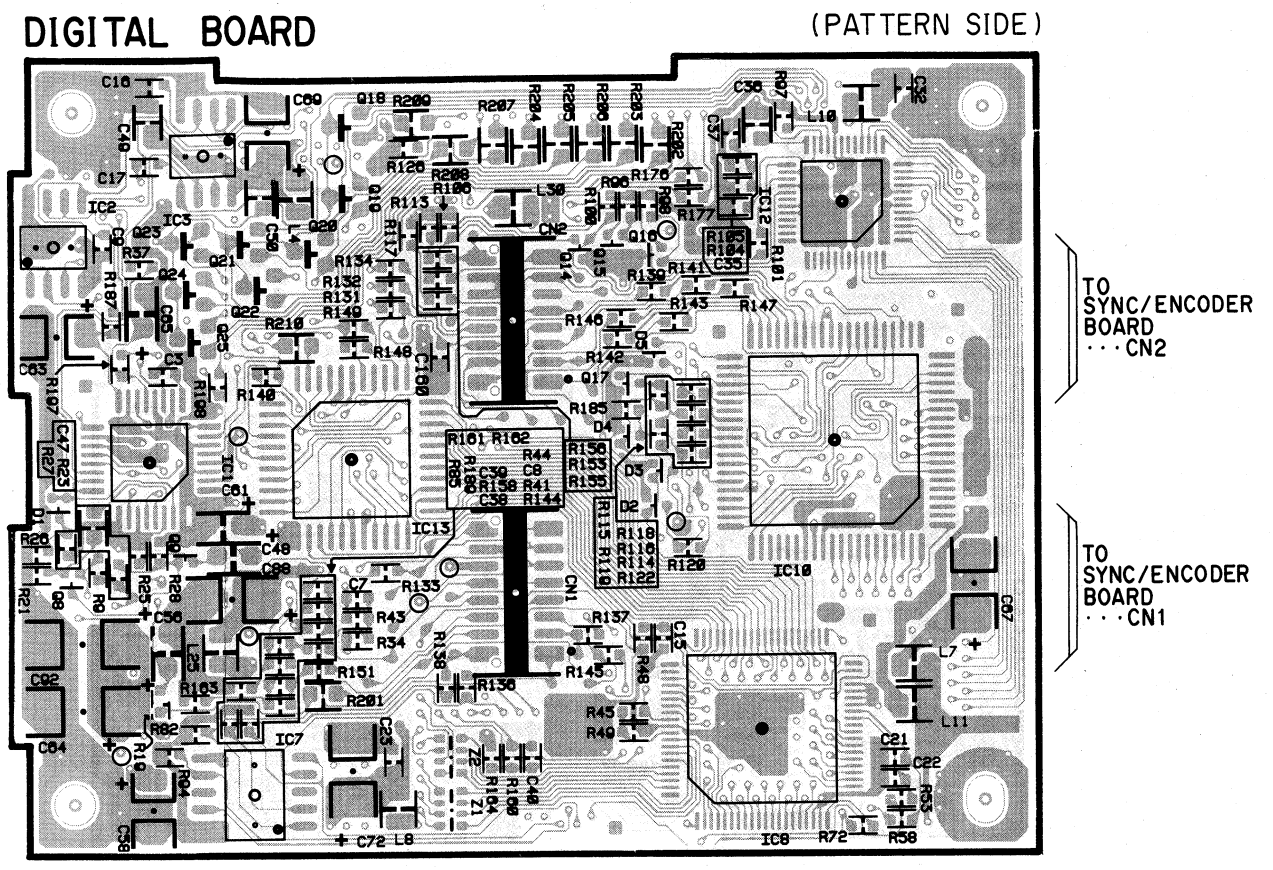
IC4	D6	Q11	C5	D8	B5
IC5	C7	Q29	A7	D9	B5
IC7	D3	Q45	A7	D10	B5
IC8	B8	Q46	B5	D11	B5
IC9	B6	Q47	B5		
IC10	D4,D5	Q48	B5		
IC11	E4	Q49	B5		
IC12	E2	Q50	E2		
Q1	E2	D1	D6		
Q2	B2	D2	E3		
Q3	B3	D3	E3		
Q7	B3	D4	B4		
Q10	E7	D5	B4		

< Index>
CONDUCTOR VIEW
SYNC/ENCODER BOARD

IC4	B1	Q11	B6	D8	C2
IC5	A1	Q29	C6	D9	C5
IC7	C2	Q45	C6	D10	C5
IC8	A6	Q46	C2	D11	C2
IC9	B2	Q47	C2		
IC10	B5	Q48	C5		
IC11	B5	Q49	C6		
IC12	A2	Q50	A3		
Q1	B4	D1	B6		
Q2	B4	D2	A5		
Q3	C5	D3	A5		
Q7	B5	D4	C5		
Q10	B5	D5	C4		

CONDUCTOR VIEW OF DIGITAL BOARD


DIGITAL BOARD
TO DRIVE BOARD ···CN7
TO DRIVE BOARD ···CN2
(COMPONENT SIDE)
VRCCL32E2D
IC1
IC3
IC6
IC14
IC15
CN2
CN4
CN5
CN6
CN8
NCMK-303X
D
C
B
A

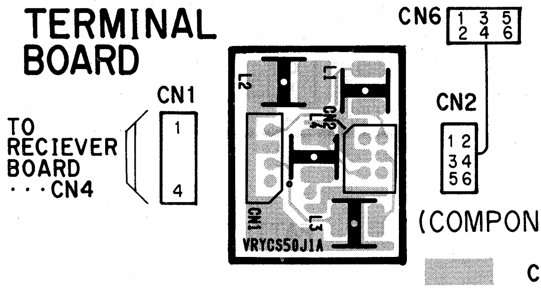

DIGITAL BOARD
(PATTERN SIDE)
TO SYNC/ENCODER BOARD ···CN2
TO SYNC/ENCODER BOARD ···CN1
IC1
IC2
IC3
IC7
IC8
IC10
IC13
CN1
CN2

▨ COMPONENT SIDE

▨ INTERMEDIATE PATTERN

▨ PATTERN SIDE

▨ INTERMEDIATE PATTERN


TERMINAL BOARD
CN1
1
4
TO RECIEVER BOARD ···CN4
CN6
1 3 5
2 4 6
CN2
1 2
3 4
5 6
L1
L2
L3
CN1
VRYCS50J1A
(COMPONENT SIDE)

▨ COMPONENT SIDE

PATTERN SIDE

1
2
3
4
5
6

< Index>

DIGITAL BOARD

IC1	C5	Q8	B4	D2	C6
IC2	D4	Q9	C4	D3	C6
IC3	D4	Q10	C3	D4	C6
IC6	B3	Q11	B3		
IC7	B5	Q14	C6		
IC8	B6	Q15	C6		
IC9	B1	Q16	C6		
IC10	C6	Q17	C6		
IC12	D6	Q18	D5		
IC13	C5	Q19	D5		
IC14	C1	Q20	D5		
IC15	C2	Q21	C5		
		Q22	C5		
		Q26	C3		
		Q27	C3		

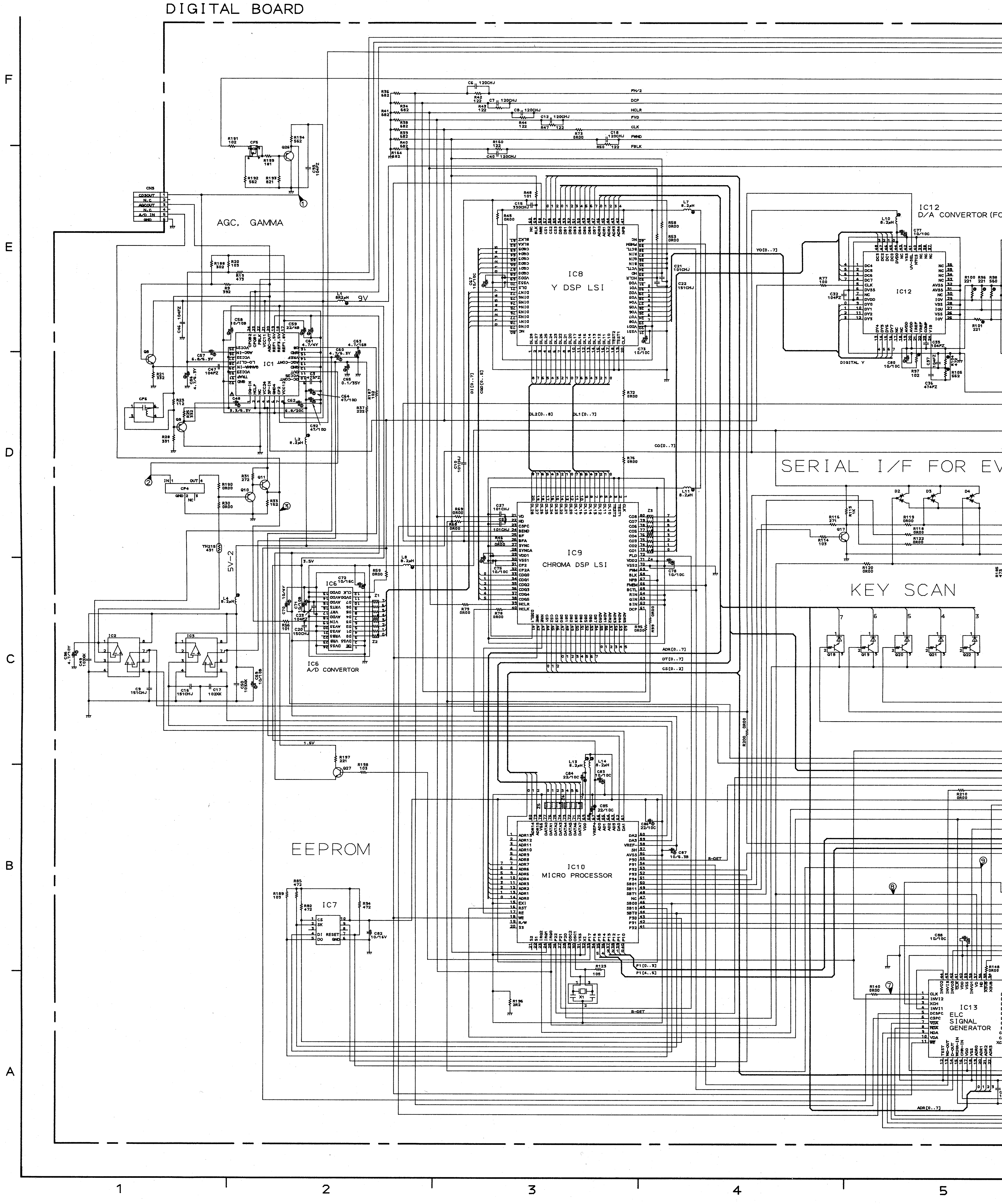
	IC8	IC9	IC10
Pin 1	0.3	2.1	2.4
2	0.8	0	2.4
3	2.8	0	2.4
4	1.0	1.8	2.4
5	0.9	1.5	2.4
6	0.8	1.5	2.8
7	1.2	0	2.7
8	1.5	2.5	3.8
9	1.2	3.4	2.4
10	0.2	0	3.6
11	1.2	0.2	3.1
12	2.1	1.2	3.1
13	1.8	1.4	3.0
14	1.3	1.1	2.8
15	1.4	1.2	0.0
16	1.4	1.8	4.3
17	1.8	2.1	3.9
18	0	3.0	4.1
19	0	0	3.4
20	2.1	0.3	1.1
21	0	0.1	3.1
22	4.3	0.5	3.1
23	0.4	2.1	4.3
24	2.4	0	0.0
25	1.3	0.8	0.1
26	1.5	1.0	4.8
27	1.7	0	2.1
28	1.6	0	4.3
29	1.5	4.3	1.7
30	1.5	0	1.9
31	1.6	0	0.0
32	0.4	0	0.0
33	0	4.3	0
34	0	4.3	0
35	0	4.1	4.3
36	0	4.2	0
37	0	4.2	4.3
38	0	4.2	4.3
39	0	0.4	4.3
40	0	0	0
Pin 41	4.3	0	0
42	3.7	4.2	0
43	3.0	4.0	4.2
44	3.1	2.8	4.3
45	3.0	2.8	4.3
46	2.7	2.8	4.3
47	0.5	1.6	0
48	0.6	0.6	0
49	0.7	1.0	4.3
50	0.8	1.0	0
51	1.0	0.1	0
52	1.1	0.4	4.3
53	0.9	0.2	4.3
54	1.8	0.4	0
55	2.4	2.7	3.2
56	2.8	2.9	0
57	2.4	3.2	0
58	4.1	3.3	1.6
59	0.5	3.8	1.6
60	0	2.8	2.3
61	0.6	0	1.7
62	0	0	2.7
63	4.2	0	0
64	4.2	0	0
65	4.1	0	0
66	4.1	0	0
67	4.3	4.3	3.7
68	4.3	0.5	4.3
69	4.3	0	4.3
70	0	0	0.5
71	4.3	4.3	0.7
72	0	2.1	0.8
73	1.8	1.2	0.9
74	1.5	1.3	1.0
75	2.2	1.4	1.2
76	1.5	1.5	1.0
77	1.6	1.5	1.8
78	1.8	1.5	0
79	0	0	2.4
80	0	1.4	2.3

	IC1	IC6	IC12	IC13
Pin 1	1.9	0	1.4	0
2	4.8	0	0	0
3	0	0	0	4.1
4	4.8	1.6	1.4	0
5	2.1	1.6	2.1	2.1
6	0	1.7	0	2.0
7	0	2.2	0	4.2
8	8.7	1.9	4.8	3.7
9	3.1	0	1.3	0.5
10	4.8	0	1.3	0.1
11	2.0	4.3	1.3	4.1
12	0	2.1	1.3	0
13	2.5	4.3	1.3	0
14	1.7	4.3	0	0
15	0	4.3	1.9	0
16	1.9	4.3	0	0
17	3.7	3.7	0	4.3
18	1.6	4.3	0	0
19	1.9	1.8	0.7	2.8
20	8.7	0	0	3.0
21	0.9	0	2.7	3.1
22	0	0	2.6	3.0
23	0	1.6	2.8	2.4
24	4.8	0	1.5	2.4
25	1.9		3.8	2.4
26	4.8		0	1.8
27	1.9		4.2	1.0
28	0		0	1.1
29	0		4.2	1.0
30	4.8		0	0.8
31	1.9		0	0.8
32	0		0	0.5
33			0	0.5
34			0	0
35			0	4.3
36			0	0.5
37			0	0.1
38			0	0
39			0	0
40			0	4.3
41			0	4.3
42			0	4.3
43			0	0
44			4.8	4.3
45			0	
46			1.6	
47			1.8	
48			2.0	

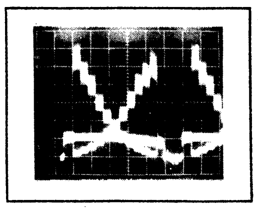
	B	C	E
Q8	1.9	8.7	1.36
9	0.5	0	1.1
10	1.9	0	2.5
11	2.5	4.8	1.8
14	4.2	4.8	3.6
15	4.5	4.7	3.9
16	4.2	4.8	0
17	0	4.4	0
18	0	4.3	0
19	0	4.3	3.8
20	0	4.3	2.4
26	1.7	0	2.3
27	0	3.1	1.6

	IC2	IC3	IC7
Pin 1	1.7	2.2	4.2
2	1.7	2.2	0
3	1.7	2.2	0
4	0	0	4.3
5	1.7	3.1	4.3
6	1.7	3.1	0
7	1.7	3.1	0
8	4.8	4.8	0
9			4.3
10			4.3

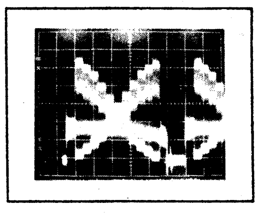
SCHEMATIC DIAGRAM OF DIGITAL


DIGITAL BOARD
AGC. GAMMA
CN5
CDSOUT
N.C
AGCOUT
N.C
A/D IN
GND
IC1
IC2
IC3
IC6
A/D CONVERTOR
IC7
EEPROM
IC8
Y DSP LSI
IC9
CHROMA DSP LSI
IC10
MICRO PROCESSOR
IC12
D/A CONVERTOR (FO
SERIAL I/F FOR EV
KEY SCAN
IC13
ELC
SIGNAL
GENERATOR
5V-2
9V
1.5V
3.5V
DIGITAL Y
FH/2
DCP
HCLR
FVD
CLK
FWND
FBLK
YO[0..7]
CO[0..7]
DL2[0..8]
DL1[0..7]
ADR[0..7]
DT[0..7]
CS[0..2]
P1[0..3]
P1[4..5]
R-DET
B-DET
F
E
D
C
B
A
1
2
3
4
5

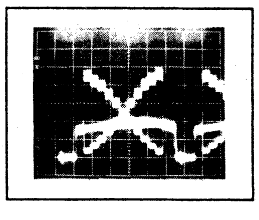
1. 10µsec/DIV,0.1V/DIV



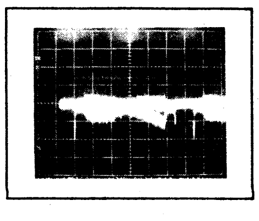
2. 10µsec/DIV,0.2V/DIV



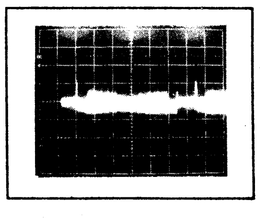
3. 10µsec/DIV,0.2V/DIV



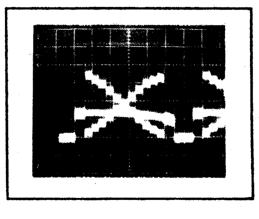
4. 10µsec/DIV,50mV/DIV



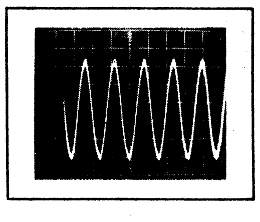
5. 10µsec/DIV,50mV/DIV



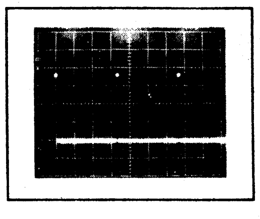
6.10µsec/DIV,50mV/DIV



7. 10µsec/DIV,0.5V/DIV

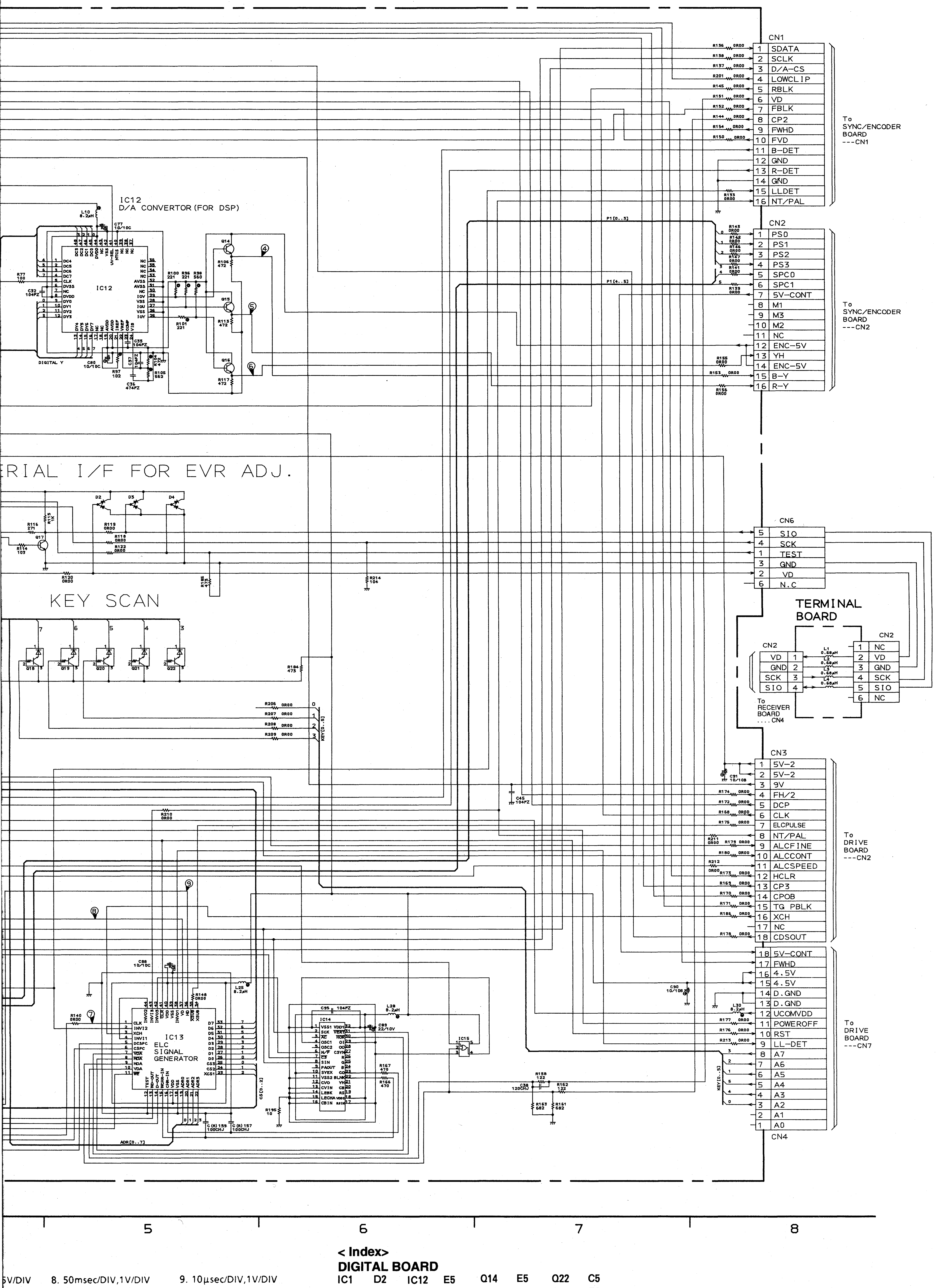


8. 50msec/DIV,1V/DIV

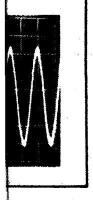


9. 10µ

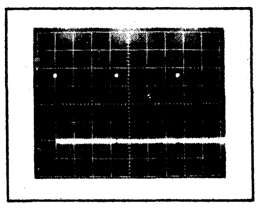
GRAM OF DIGITAL BOARD



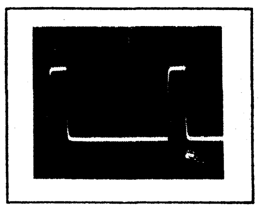
IC12
D/A CONVERTOR (FOR DSP)
IC13
ELC
SIGNAL
GENERATOR
IC14
IC15
SERIAL I/F FOR EVR ADJ.
KEY SCAN
KEY[0..5]
ADR[0..7]
CS[0..2]
P1[0..3]
P1[4..5]
DIGITAL Y
CN1
1 SDATA
2 SCLK
3 D/A-CS
4 LOWCLIP
5 RBLK
6 VD
7 FBLK
8 CP2
9 FWHD
10 FVD
11 B-DET
12 GND
13 R-DET
14 GND
15 LLDET
16 NT/PAL
To SYNC/ENCODER BOARD ---CN1
CN2
1 PS0
2 PS1
3 PS2
4 PS3
5 SPC0
6 SPC1
7 5V-CONT
8 M1
9 M3
10 M2
11 NC
12 ENC-5V
13 YH
14 ENC-5V
15 B-Y
16 R-Y
To SYNC/ENCODER BOARD ---CN2
CN6
5 SIO
4 SCK
1 TEST
3 GND
2 VD
6 N.C
TERMINAL BOARD
CN2
1 VD
2 GND
3 SCK
4 SIO
CN2
1 NC
2 VD
3 GND
4 SCK
5 SIO
6 NC
To RECEIVER BOARD CN4
CN3
1 5V-2
2 5V-2
3 9V
4 FH/2
5 DCP
6 CLK
7 ELCPULSE
8 NT/PAL
9 ALCFINE
10 ALCCONT
11 ALCSPEED
12 HCLR
13 CP3
14 CPOB
15 TG PBLK
16 XCH
17 NC
18 CDSOUT
To DRIVE BOARD ---CN2
18 5V-CONT
17 FWHD
16 4.5V
15 4.5V
14 D.GND
13 D.GND
12 UCOMVDD
11 POWEROFF
10 RST
9 LL-DET
8 A7
7 A6
6 A5
5 A4
4 A3
3 A2
2 A1
1 A0
CN4
To DRIVE BOARD ---CN7
5
6
7
8



V/DIV



8. 50msec/DIV,1V/DIV



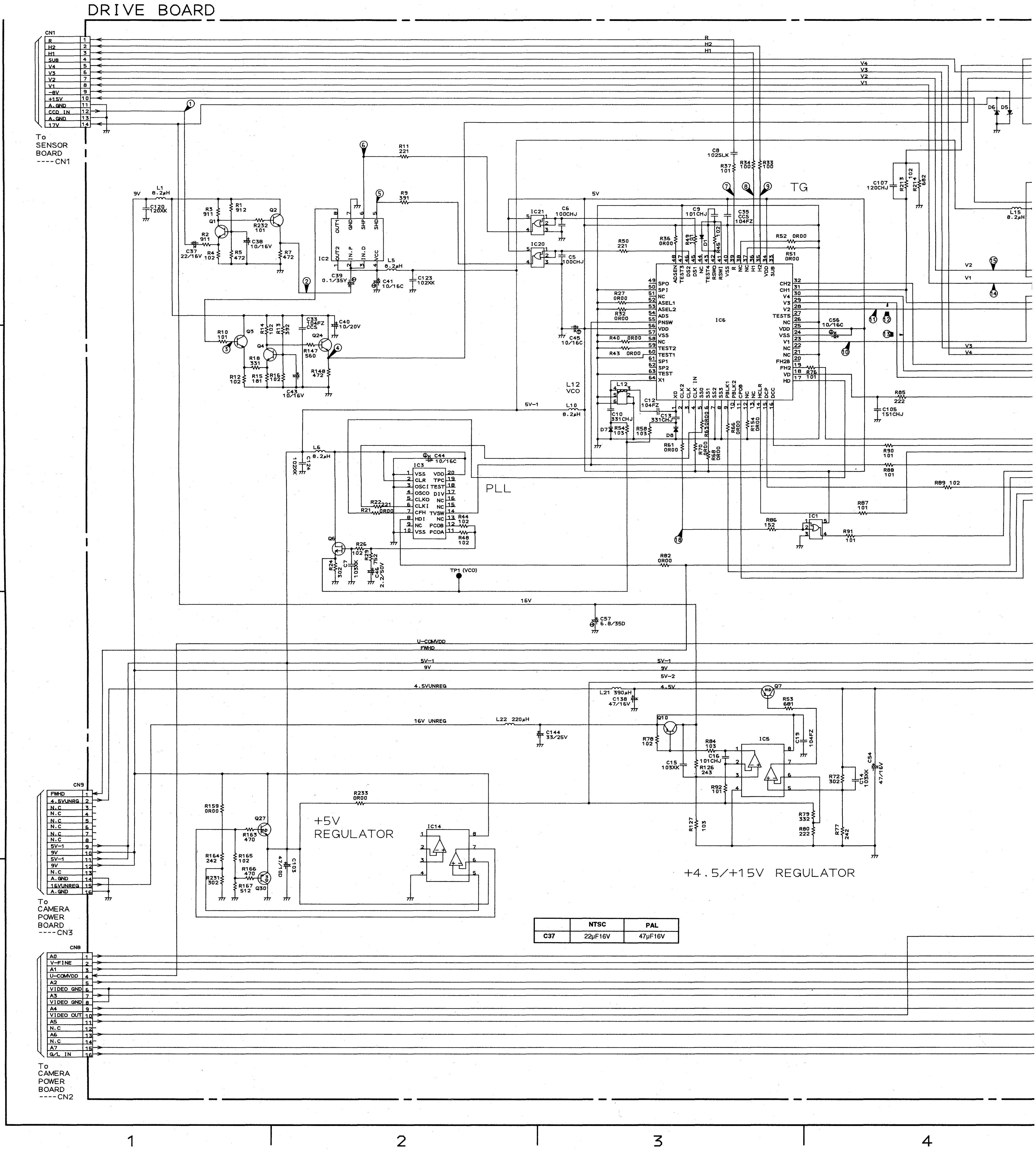
9. 10µsec/DIV,1V/DIV

< Index>

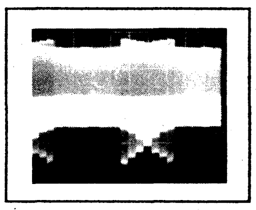
DIGITAL BOARD

IC1	D2	IC12	E5	Q14	E5	Q22	C5		
IC2	C1	IC13	A5	Q15	E5	Q26	E2		
IC3	C1	IC14	B6	Q16	D5	Q27	B2		
IC6	C2	IC15	B6	Q17	D4	D2	D5		
IC7	B2	Q8	D1	Q18	C4	D3	D5		
IC8	E3	Q9	D1	Q19	C5	D4	D5		
IC9	D3	Q10	D2	Q20	C5				
IC10	B3	Q11	D2	Q21	C5				

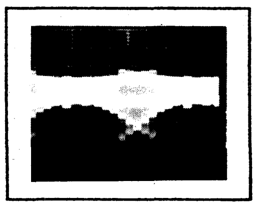
SCHEMATIC DIAGRAM OF DRIV


DRIVE BOARD
CN1
R
H2
H1
SUB
V4
V3
V2
V1
-8V
+15V
A.GND
CCD IN
A.GND
17V
To SENSOR BOARD ----CN1
D
C
B
A
1
2
3
4
TG
PLL
IC6
IC3
IC2
IC1
IC5
IC14
IC20
IC21
L12 VCO
TP1 (VCO)
16V
U-COMVDD
FWHD
5V-1
9V
5V-2
4.5VUNREG
4.5V
16V UNREG
L22 220μH
L21 390μH
+5V REGULATOR
+4.5/+15V REGULATOR
CN9
FWHD
4.5VUNREG
N.C
5V-1
9V
A.GND
16VUNREG
To CAMERA POWER BOARD ----CN3
CN8
A0
V-FINE
A1
U-COMVDD
A2
VIDEO GND
A3
A4
VIDEO OUT
A5
A6
A7
G/L IN
To CAMERA POWER BOARD ----CN2

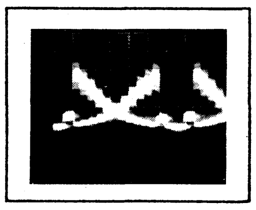
	NTSC	PAL
C37	22μF16V	47μF16V



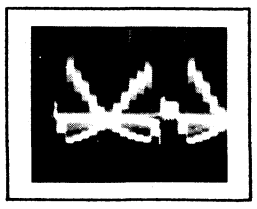
1. 10μsec/DIV,0.2V/DIV



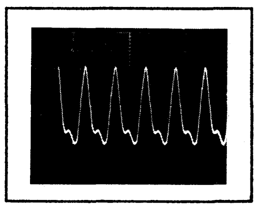
2. 10μsec/DIV,0.2V/DIV



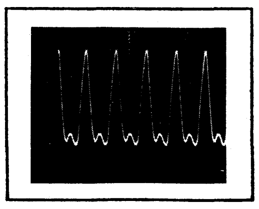
3. 10μsec/DIV,0.2V/DIV



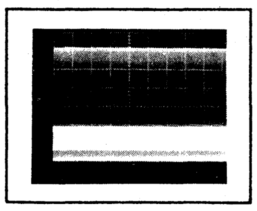
4. 10μsec/DIV,50mV/DIV



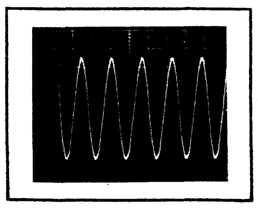
5. 50msec/DIV,1V/DIV



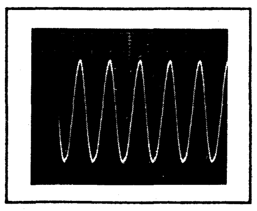
6. 50nsec/DIV,1V/DIV



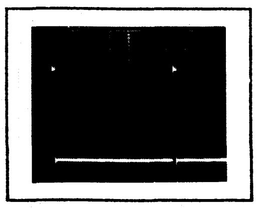
7. 10μsec/DIV,1V/DIV



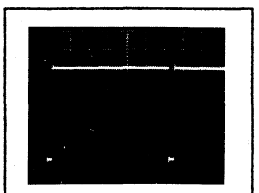
8. 50nsec/DIV,1V/DIV



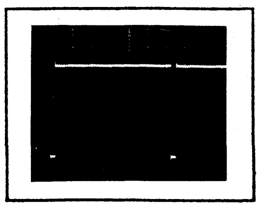
9. 50nsec/DIV,1V/DIV



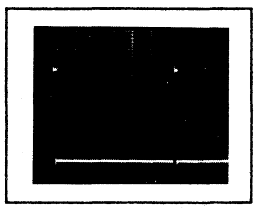
10. 10μsec/DIV,1V/DIV



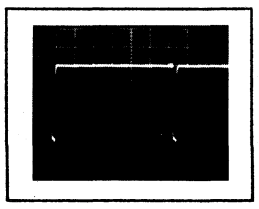
11. 10μsec/DIV,1V/DIV



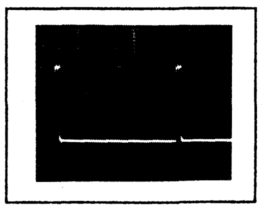
12. 10μsec/DIV,1V/DIV



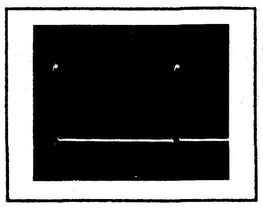
13. 10μsec/DIV,1V/DIV



14. 10μsec/DIV,1V/DIV



15. 10μsec/DIV,1V/DIV

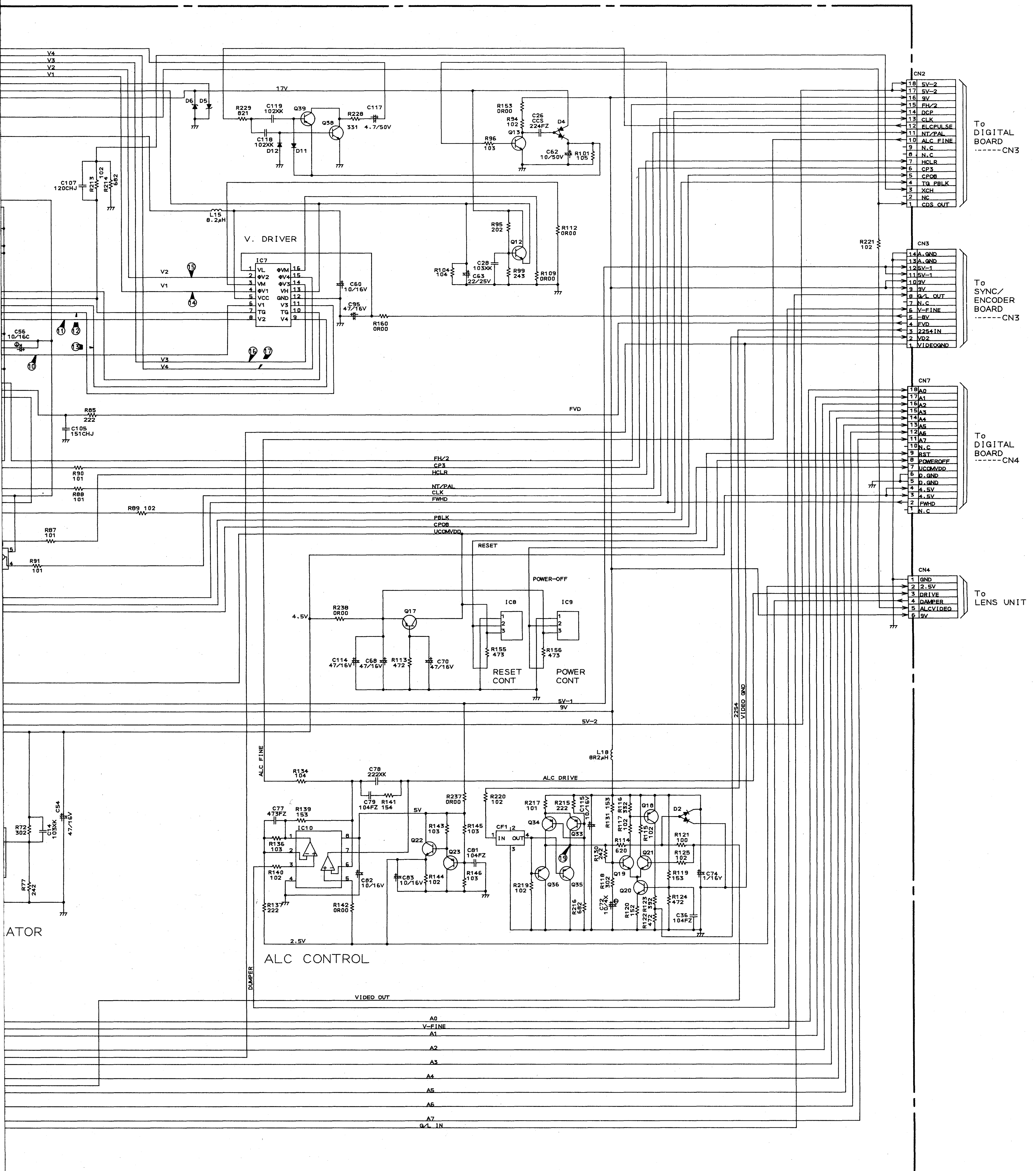


16. 10μsec/DIV,1V/DIV

17

18

DIAGRAM OF DRIVE BOARD

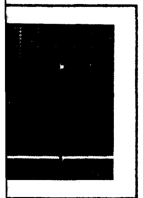

V. DRIVER
IC7
VL
ΦV2
VM
ΦV1
VCC
V1
TG
V2
ΦVM
ΦV4
ΦV3
VH
GND
V3
TG
V4
V1
V2
V3
V4
17V
L15 8.2μH
R229 821
C119 102XK
C118 102XK
Q39
Q38
R228 331
C117 4.7/50V
D5
D6
D11
D12
C107 120CHJ
R213 102
R214 682
C56 10/16C
C60 10/16V
C95 47/16V
R160 0R00
R153 0R00
R94 102
C26 CCS 224FZ
D4
Q13
R96 103
C62 10/50V
R101 105
R95 202
Q12
R112 0R00
R104 104
C28 103XK
C63 22/25V
R99 243
R109 0R00
R221 102
R85 222
C105 151CHJ
FVD
R90 101
R88 101
R89 102
R87 101
R91 101
FH/2
CP3
HCLR
NT/PAL
CLK
FWHD
PBLK
CPOB
UCOMVDD
RESET
POWER-OFF
IC8
IC9
R238 0R00
4.5V
Q17
C114 47/16V
C68 47/16V
R113 472
C70 47/16V
R155 473
R156 473
RESET CONT
POWER CONT
5V-1
9V
5V-2
2254
VIDEO GND
L18 8R2μH
ALC FINE
ALC DRIVE
R134 104
C78 222XK
C79 104FZ
R141 154
5V
R237 0R00
R220 102
C77 473FZ
R139 153
R136 103
IC10
R140 102
R137 222
R142 0R00
C82 10/16V
R143 103
R145 103
Q22
Q23
C81 104FZ
C83 10/16V
R144 102
R146 103
CF1
IN
OUT
R217 101
R215 222
C115 10/16V
Q34
Q33
Q36
Q35
R219 102
R216 682
R131 153
R117 102
R116 332
Q18
D2
R130 242
R114 620
R115 102
R121 100
R125 102
C74 1/16V
R118 302
C72 10/4X
Q19
Q21
R119 153
Q20
R120 152
R122 472
R123 392
R124 472
C36 104FZ
2.5V
ALC CONTROL
DUMPER
VIDEO OUT
A0
V-FINE
A1
A2
A3
A4
A5
A6
A7
G/L IN
R72 302
C14 103XK
C54 47/16V
R77 242
ATOR
⑩
⑪
⑫
⑬
⑭
⑮
⑯
⑰
⑲
CN2
18 5V-2
17 5V-2
16 9V
15 FH/2
14 DCP
13 CLK
12 ELCPULSE
11 NT/PAL
10 ALC FINE
9 N.C
8 N.C
7 HCLR
6 CP3
5 CPOB
4 TG PBLK
3 XCH
2 NC
1 CDS OUT
To DIGITAL BOARD ------CN3
CN3
14 A.GND
13 A.GND
12 5V-1
11 5V-1
10 9V
9 3V
8 G/L OUT
7 N.C
6 V-FINE
5 -8V
4 FVD
3 2254IN
2 VD2
1 VIDEOGND
To SYNC/ ENCODER BOARD ------CN3
CN7
18 A0
17 A1
16 A2
15 A3
14 A4
13 A5
12 A6
11 A7
10 N.C
9 RST
8 POWEROFF
7 UCOMVDD
6 D.GND
5 D.GND
4 4.5V
3 4.5V
2 FWHD
1 N.C
To DIGITAL BOARD ------CN4
CN4
1 GND
2 2.5V
3 DRIVE
4 DAMPER
5 ALCVIDEO
6 9V
To LENS UNIT

4

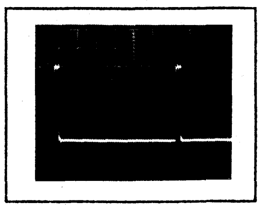
5

6

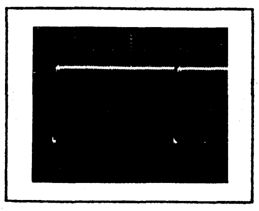
DIV,1V/DIV



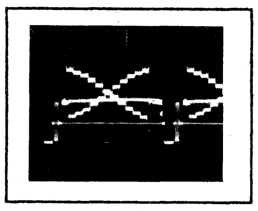
15. 10μsec/DIV,1V/DIV



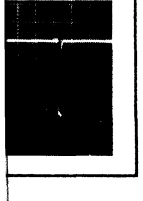
17. 10μsec/DIV,1V/DIV



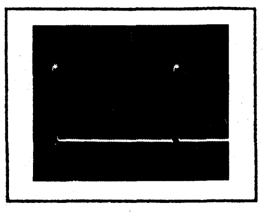
19. 10μsec/DIV,0.5V/DIV



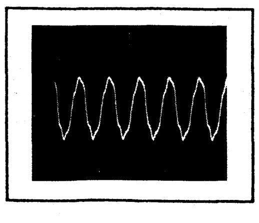
DIV,1V/DIV



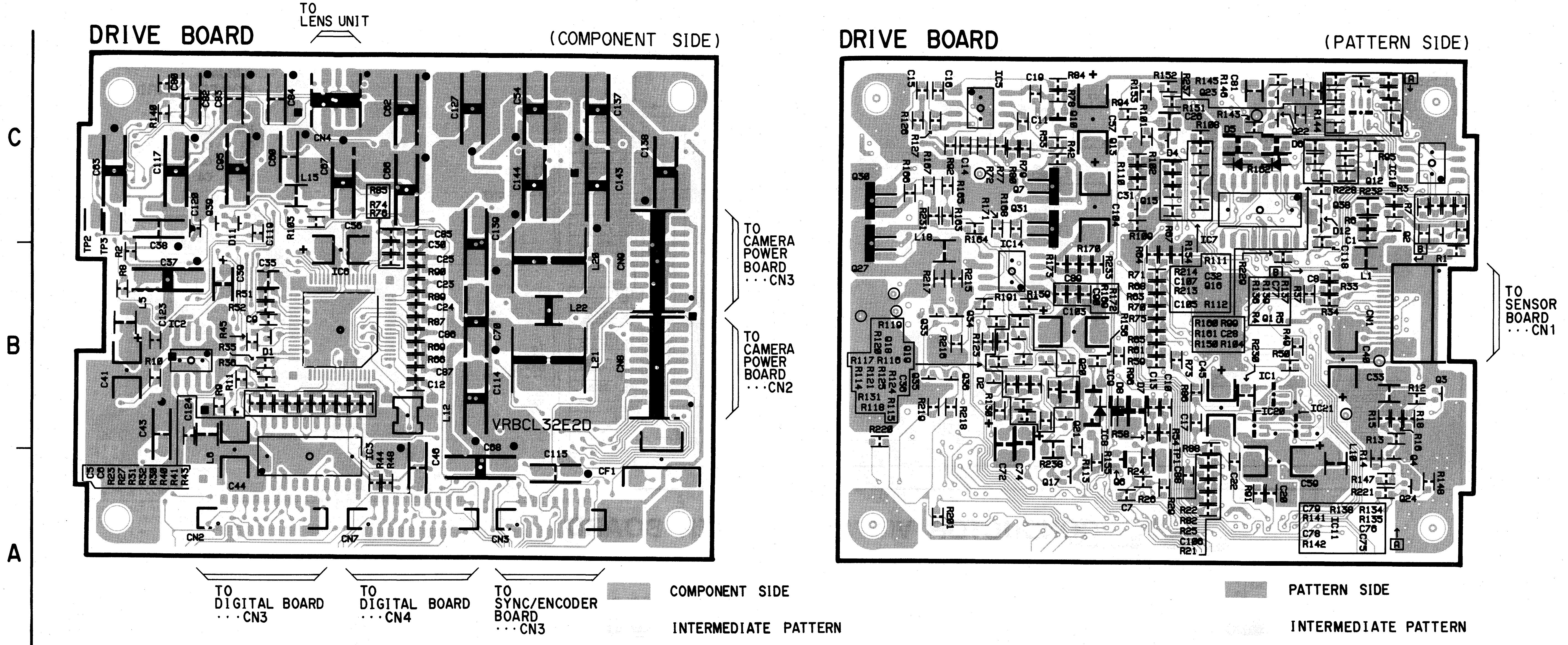
16. 10μsec/DIV,1V/DIV



18. 50nsec/DIV,2V/DIV



CONDUCTOR VIEW OF DRIVE BOARD


DRIVE BOARD
TO LENS UNIT
(COMPONENT SIDE)
TO CAMERA POWER BOARD ···CN3
TO CAMERA POWER BOARD ···CN2
VRBCL32E2D
CN2
CN7
CN3
CN4
TO DIGITAL BOARD ···CN3
TO DIGITAL BOARD ···CN4
TO SYNC/ENCODER BOARD ···CN3
COMPONENT SIDE
INTERMEDIATE PATTERN
C
B
A
DRIVE BOARD
(PATTERN SIDE)
TO SENSOR BOARD ···CN1
PATTERN SIDE
INTERMEDIATE PATTERN

1 2 3 4 5 6 7

	IC1	IC2	IC3	IC4	IC5	IC7	IC8	IC9	IC10	IC20	IC21	IC22
Pin 1	2.9	4.8	0	0	9.4	-7.8	0	0	2.3	1.3	1.1	5.6
2	2.9	2.6	4.8	0.2	4.8	-7.5	4.4	4.5	2.3	1.3	1.1	0
3	0.5	2.6	0	0.3	4.8	0	4.5	4.5	2.3	0	0	5.0
4	2.9	4.8	4.8	0	0	-0.2			0	0.5	0.4	
5	5.4	1.2	0	4.8	1.9	4.8			2.3	4.8	4.8	
6		1.2	2.3	4.8	1.9	0.1			2.3			
7		0	0.4	5.0	4.2	4.8			4.1			
8		1.8	0.6	8.8	17.4	0			0			
9			0			0.1						
10			0			4.8						
11			2.0			4.6						
12			2.0			0						
13			0			14.6						
14			0			-7.4						
15			0			00.2						
16			0			0						
17			4.8									
18			4.8									
19			4.8									
20			4.8									

	IC6		IC6
Pin 1	0	Pin 33	4.7
2	2.0	34	4.8
3	0	35	1.8
4	0	36	2.4
5	0	37	0
6	4.8	38	0
7	0	39	1.5
8	0	40	0
9	0	41	1.1
10	0.7	42	8.5
11	0	43	0
12	0	44	0
13	0	45	1.1
14	0.5	46	1.4
15	0.1	47	0
16	0	48	4.8
17	0.4	49	0
18	0.1	50	0
19	2.4	51	0
20	2.4	52	0

	IC6		IC6
Pin21	0	Pin 53	0
22	4.8	54	4.8
23	0.1	55	0
24	0	56	0
25	4.8	57	0
26	0	58	0
27	4.8	59	0
28	4.6	60	0
29	4.6	61	0
30	0.1	62	0
31	4.8	63	0
32	4.8	64	0

	B	C	E
Q1	3.0	6.9	2.2
2	8.6	8.7	7.9
3	1.7	8.7	1.4
4	1.7	5.4	1.05
6	2.3	2.0	4.8
7	4.3	4.5	5.0
8	6.7	10.0	6.2
9	10.0	9.1	10.1
10	15.2	16.6	14.6
12	15.2	16.6	14.6
13	0.1	7.1	0
17	3.6	4.3	4.4
18	8.0	8.7	8.7
19	2.8	7.1	2.2
20	2.0	2.2	1.4
21	2.2	8.7	2.2
22	3.0	4.8	2.3
23	2.4	0	3.0

	B	C	E
24	5.4	8.7	4.7
33	6.7	2.2	7.3
34	6.7	2.2	7.3
35	1.6	0	2.2
36	1.6	0	2.2
37	4.9	5.0	5.6
38	0	12.7	0
39	23.4	-	24.0

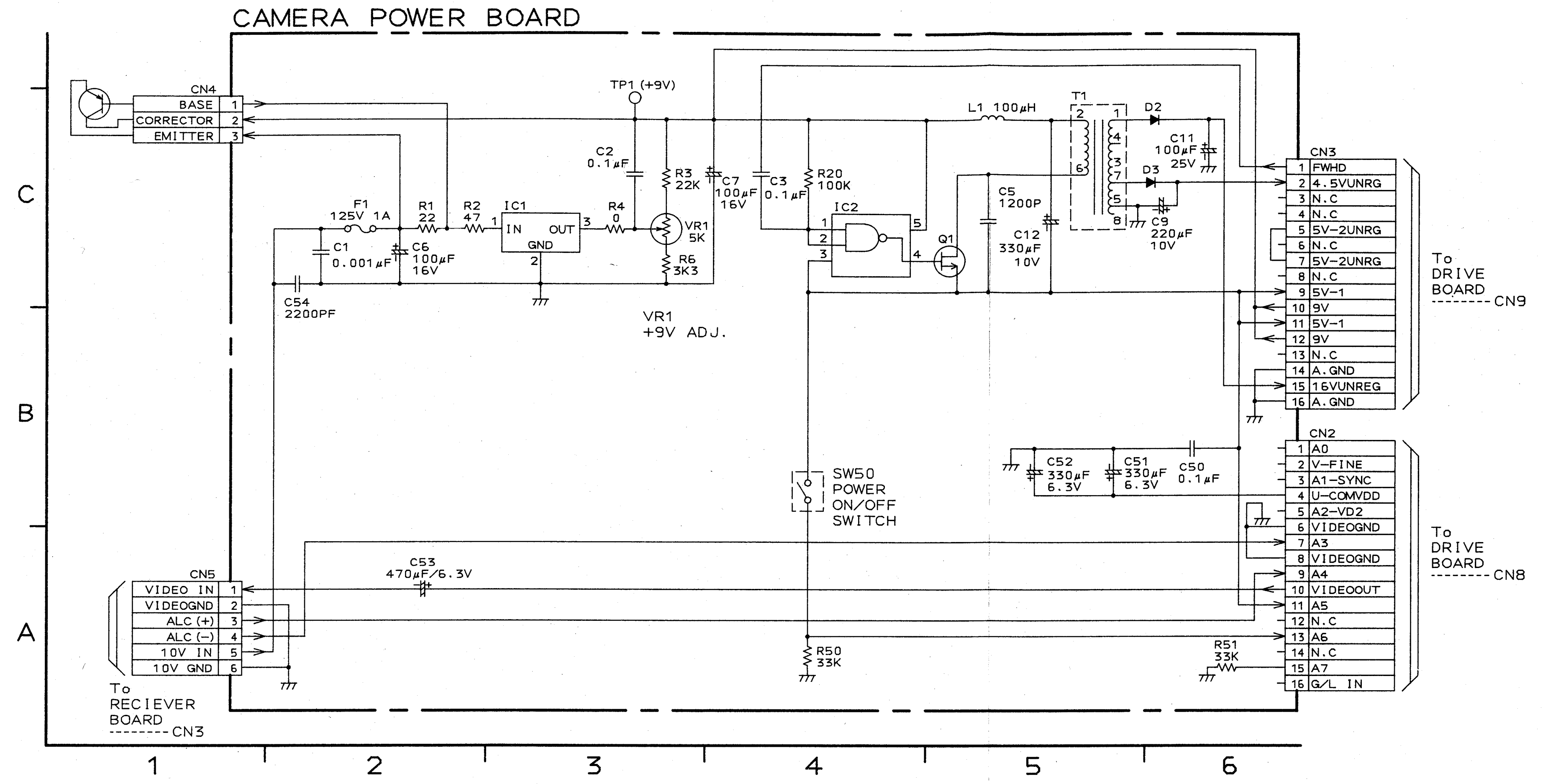
< Index>
SCHEMATIC DIAGRAM
DRIVE BOARD

IC1	C4	Q7	B3	Q36	B5
IC2	D2	Q10	B3	Q38	D5
IC3	C2	Q12	D5	Q39	D5
IC5	B3	Q13	D5	D1	D3
IC6	D3	Q17	C5	D2	B6
IC7	D4	Q18	B6	D4	D6
IC8	C5	Q19	B6	D5	D4
IC9	C6	Q20	B6	D6	D4
IC10	B5	Q21	B6	D7	C3
IC14	B2	Q22	B5	D8	C3
IC20	D3	Q23	B5	D11	D5
IC21	D3	Q24	C2	D12	D5
Q1	D1	Q27	B1		
Q2	D2	Q30	A1		
Q3	C1	Q33	B6		
Q4	C1	Q34	B5		
Q6	C2	Q35	B6		

< Index>
CONDUCTOR VIEW
DRIVE BOARD

IC1	B6	Q7	C5	Q36	B5
IC2	B1	Q10	C5	Q38	C7
IC3	A2	Q12	C7	Q39	C1
IC5	C5	Q13	C6	D1	B2
IC6	B2	Q17	A5	D2	B5
IC7	C6	Q18	B5	D4	C6
IC8	B6	Q19	B5	D5	C6
IC9	B6	Q20	B5	D6	C6
IC10	C7	Q21	B5	D7	B6
IC14	B5	Q22	C6	D8	B6
IC20	B6	Q23	C6	D11	C1
IC21	B7	Q24	A7	D12	C7
Q1	B6	Q27	B4		
Q2	C7	Q30	C4		
Q3	B7	Q33	B5		
Q4	A7	Q34	B5		
Q6	A6	Q35	B5		

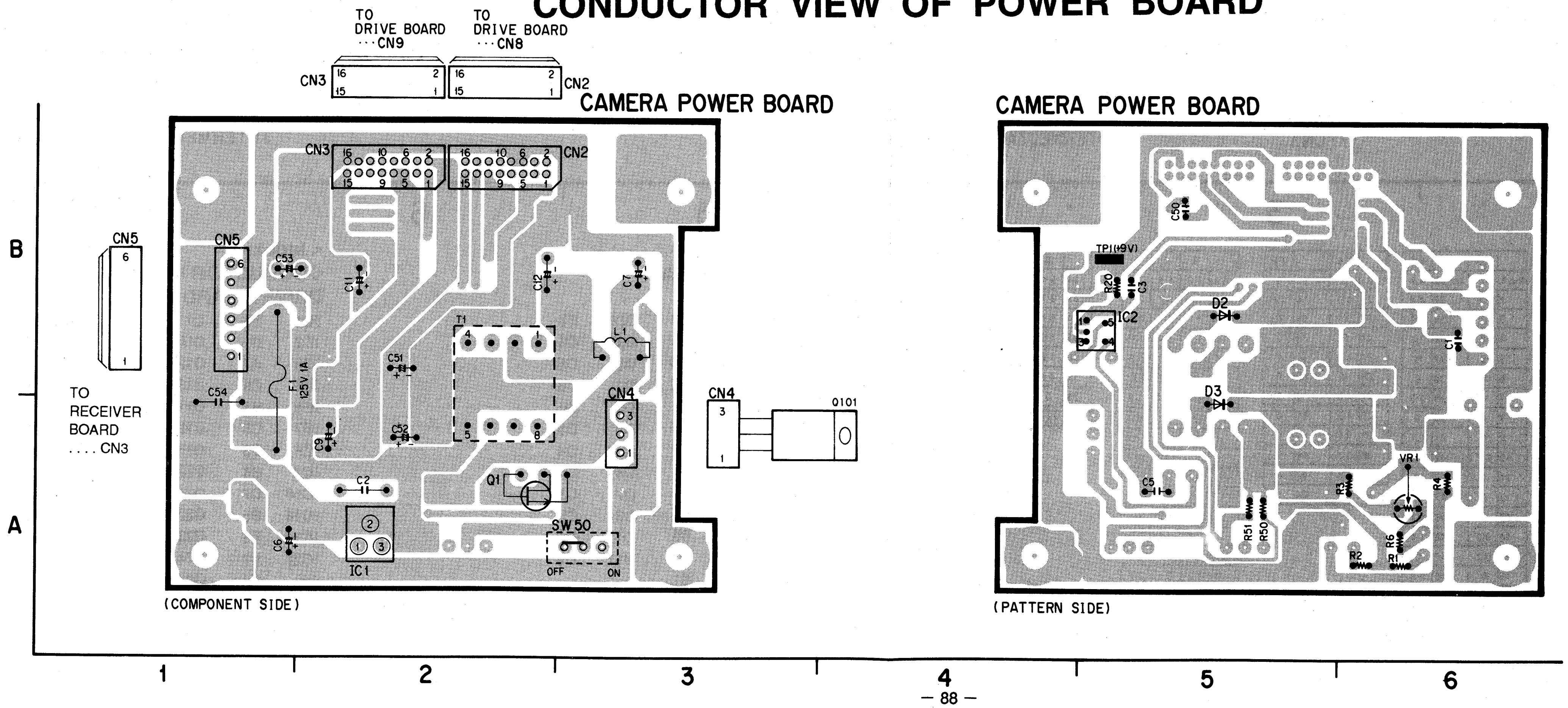
SCHEMATIC DIAGRAM OF POWER BOARD


CAMERA POWER BOARD
CN4
BASE 1
CORRECTOR 2
EMITTER 3
TP1 (+9V)
C2 0.1μF
R3 22K
C7 100μF 16V
C3 0.1μF
R20 100K
IC2
L1 100μH
T1
D2
C11 100μF 25V
D3
C9 220μF 10V
C5 1200P
C12 330μF 10V
Q1
F1 125V 1A
R1 22
R2 47
IC1
IN OUT
GND
R4 0
VR1 5K
R6 3K3
C1 0.001μF
C6 100μF 16V
C54 2200PF
VR1 +9V ADJ.
CN3
1 FWHD
2 4.5VUNRG
3 N.C
4 N.C
5 5V-2UNRG
6 N.C
7 5V-2UNRG
8 N.C
9 5V-1
10 9V
11 5V-1
12 9V
13 N.C
14 A.GND
15 16VUNREG
16 A.GND
To DRIVE BOARD --------CN9
CN2
1 A0
2 V-FINE
3 A1-SYNC
4 U-COMVDD
5 A2-VD2
6 VIDEOGND
7 A3
8 VIDEOGND
9 A4
10 VIDEOOUT
11 A5
12 N.C
13 A6
14 N.C
15 A7
16 G/L IN
To DRIVE BOARD --------CN8
C52 330μF 6.3V
C51 330μF 6.3V
C50 0.1μF
SW50 POWER ON/OFF SWITCH
C53 470μF/6.3V
CN5
VIDEO IN 1
VIDEOGND 2
ALC (+) 3
ALC (−) 4
10V IN 5
10V GND 6
To RECIEVER BOARD --------CN3
R50 33K
R51 33K
C
B
A
1
2
3
4
5
6

< Index>
POWER BOARD

IC1	C3
IC2	C4
Q1	C5
D2	C6
D3	C6

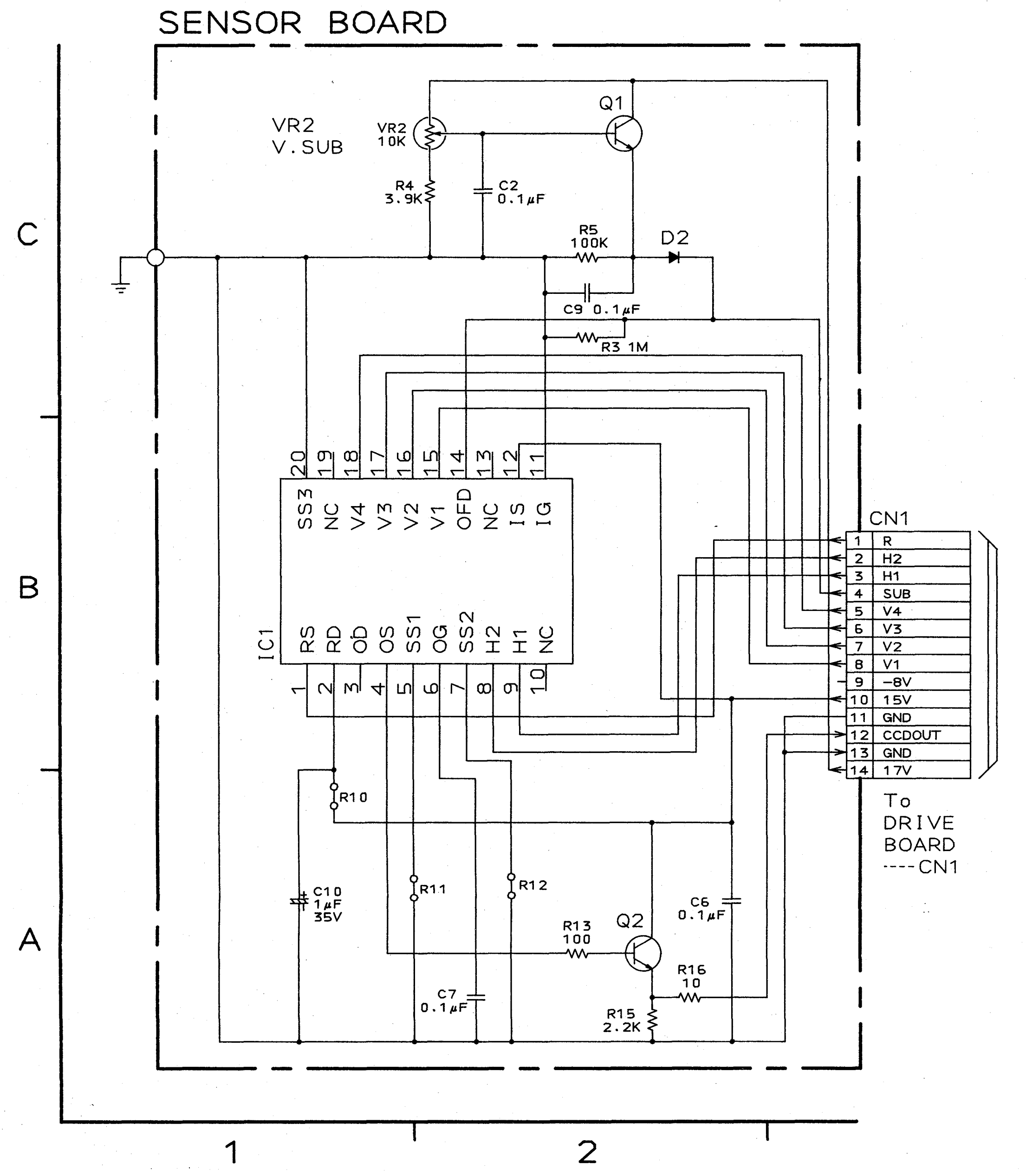
CONDUCTOR VIEW OF POWER BOARD


TO DRIVE BOARD ···CN9
TO DRIVE BOARD ···CN8
CN3
CN2
CAMERA POWER BOARD
CN5
TO RECEIVER BOARD CN3
C53
C11
C12
C7
T1
L1
C51
F1 125V 1A
C54
C9
C52
CN4
Q101
C2
Q1
C6
IC1
SW50
OFF
ON
(COMPONENT SIDE)
CAMERA POWER BOARD
C50
TP1(+9V)
R20
C3
IC2
D2
C1
D3
C5
VR1
R3
R4
R51
R50
R6
R1
R2
(PATTERN SIDE)
B
A
1
2
3
4
5
6

< Index>
POWER BOARD

IC1	A2
IC2	B5
Q1	A2
D2	B5
D3	A5

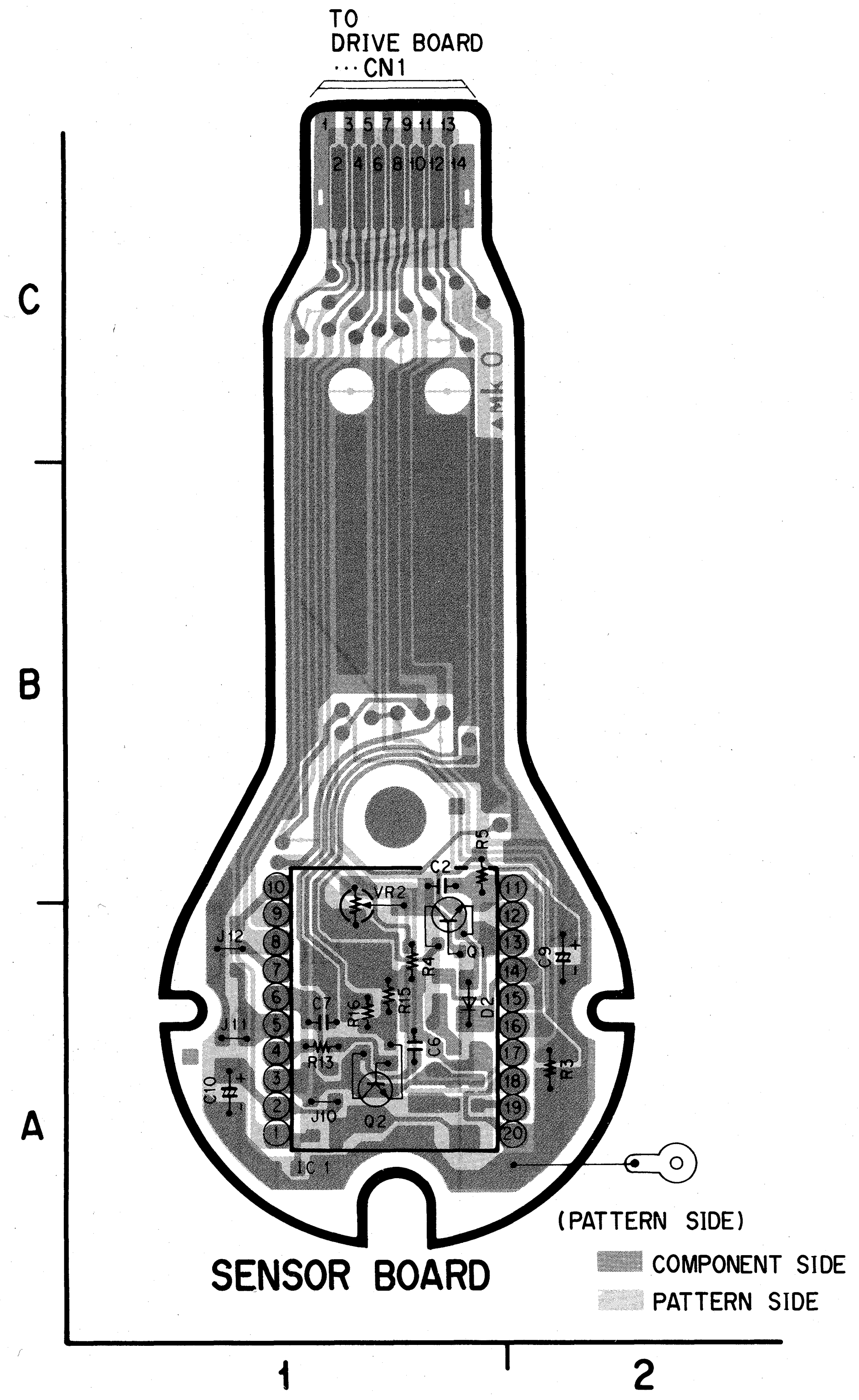
SCHEMATIC DIAGRAM OF SENSOR BOARD


SENSOR BOARD
VR2
V.SUB
VR2 10K
Q1
R4 3.9K
C2 0.1μF
R5 100K
D2
C9 0.1μF
R3 1M
IC1
SS3 NC V4 V3 V2 V1 OFD NC IS IG
RS RD OD OS SS1 OG SS2 H2 H1 NC
CN1
1 R
2 H2
3 H1
4 SUB
5 V4
6 V3
7 V2
8 V1
9 -8V
10 15V
11 GND
12 CCDOUT
13 GND
14 17V
To DRIVE BOARD ----CN1
R10
C10 1μF 35V
R11
R12
R13 100
Q2
C6 0.1μF
R16 10
C7 0.1μF
R15 2.2K
A
B
C
1
2

< Index>
SENSOR BOARD

IC1	B1, 2
Q1	C2
Q2	A2
D2	C2

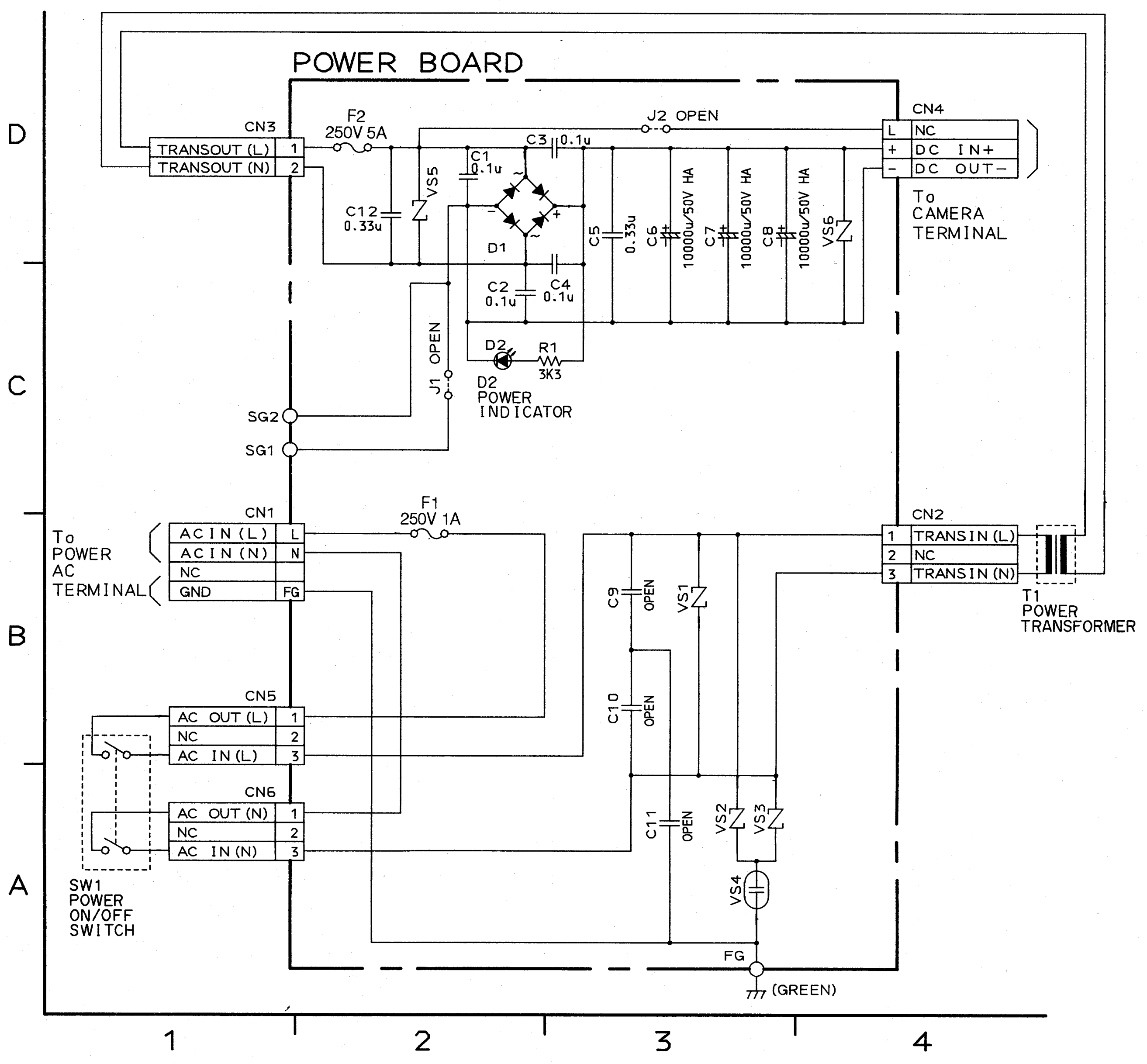
CONDUCTOR VIEW OF SENSOR BOARD


TO DRIVE BOARD ···CN1
1 3 5 7 9 11 13
2 4 6 8 10 12 14
VR2
C2
R5
Q1
C9
R4
R15
R16
D2
R3
C7
J12
J11
R13
C6
C10
J10
Q2
IC1
SENSOR BOARD
(PATTERN SIDE)
COMPONENT SIDE
PATTERN SIDE
A
B
C
1
2

< Index>
SENSOR BOARD

IC1	A1, 2
Q1	A1
Q2	A1
D2	A1

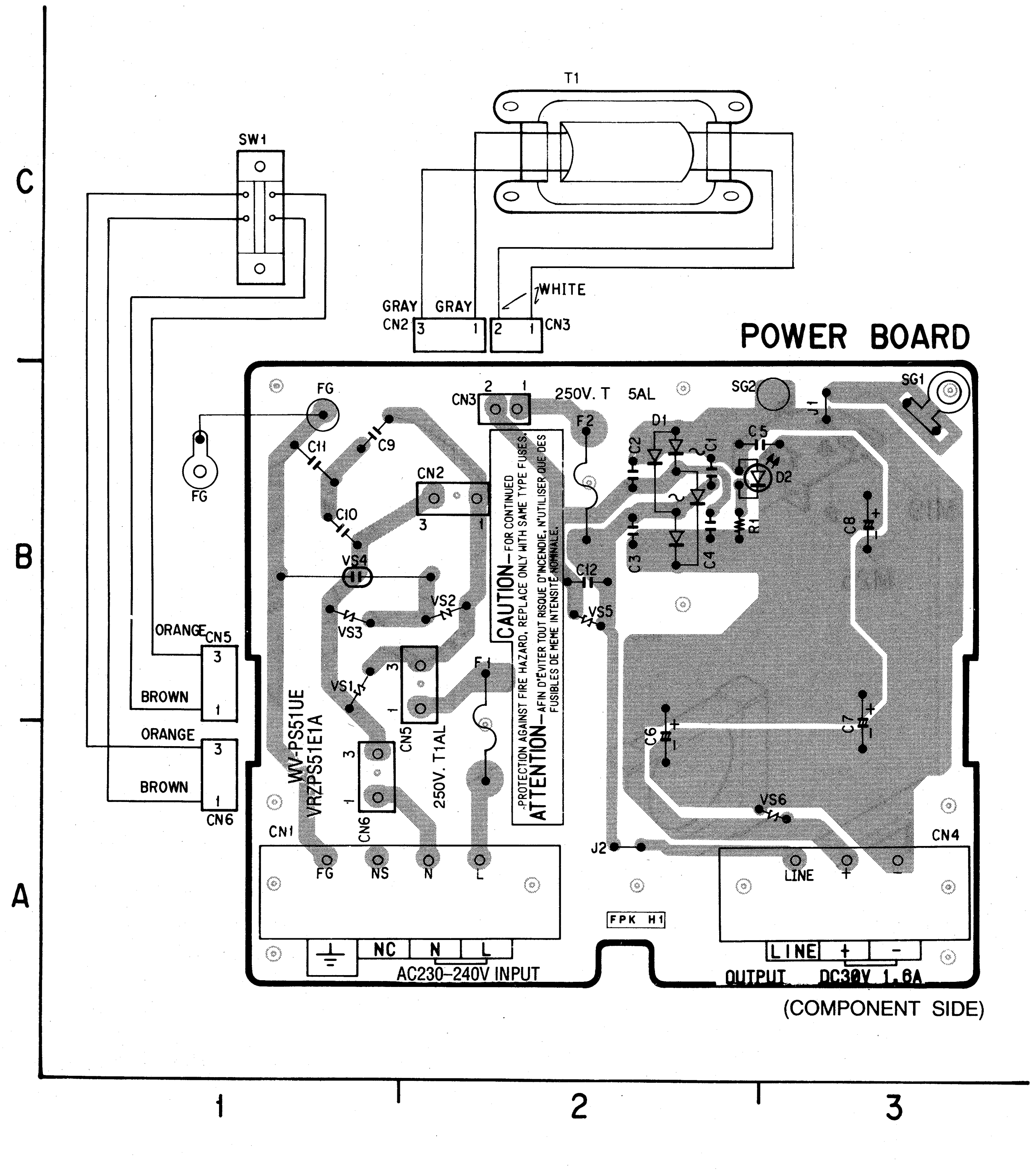
SCHEMATIC DIAGRAM OF POWER SWITCH BOARD


POWER BOARD
CN3
TRANSOUT (L) 1
TRANSOUT (N) 2
F2 250V 5A
C12 0.33u
VS5
C1 0.1u
C3 0.1u
D1
C2 0.1u
C4 0.1u
C5 0.33u
C6 10000u/50V HA
C7 10000u/50V HA
C8 10000u/50V HA
VS6
J2 OPEN
CN4
L NC
+ DC IN+
- DC OUT-
To CAMERA TERMINAL
J1 OPEN
D2 POWER INDICATOR
R1 3K3
SG2
SG1
CN1
ACIN (L) L
ACIN (N) N
NC
GND FG
To POWER AC TERMINAL
F1 250V 1A
CN2
1 TRANSIN (L)
2 NC
3 TRANSIN (N)
T1 POWER TRANSFORMER
C9 OPEN
VS1
C10 OPEN
CN5
AC OUT (L) 1
NC 2
AC IN (L) 3
CN6
AC OUT (N) 1
NC 2
AC IN (N) 3
C11 OPEN
VS2
VS3
VS4
SW1 POWER ON/OFF SWITCH
FG
(GREEN)
A
B
C
D
1
2
3
4

< Index>
POWER SWITCH BOARD

D1	D2
D2	C2

CONDUCTOR VIEW OF POWER SWITCH BOARD


T1
SW1
GRAY
GRAY
WHITE
CN2 3 1
2 1 CN3
POWER BOARD
FG
CN3
2 1
250V. T 5AL
F2
SG2
SG1
J1
C11
C9
CN2
3 1
C10
VS4
VS2
VS3
VS1
CN5
CN6
3 1
250V. T1AL
F1
CAUTION—FOR CONTINUED
-PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH SAME TYPE FUSES.
ATTENTION—AFIN D'ÉVITER TOUT RISQUE D'INCENDIE, N'UTILISER QUE DES FUSIBLES DE MEME INTENSITÉ NOMINALE.
WV-PS51UE
VRZPS51E1A
C12
VS5
D1
C1
C2
C3
C4
C5
D2
R1
C6
C7
C8
VS6
J2
ORANGE CN5
BROWN
ORANGE
BROWN
CN6
CN1
FG NS N L
NC N L
AC230-240V INPUT
FPK H1
CN4
LINE +
LINE + -
OUTPUT DC30V 1.6A
(COMPONENT SIDE)
A
B
C
1
2
3

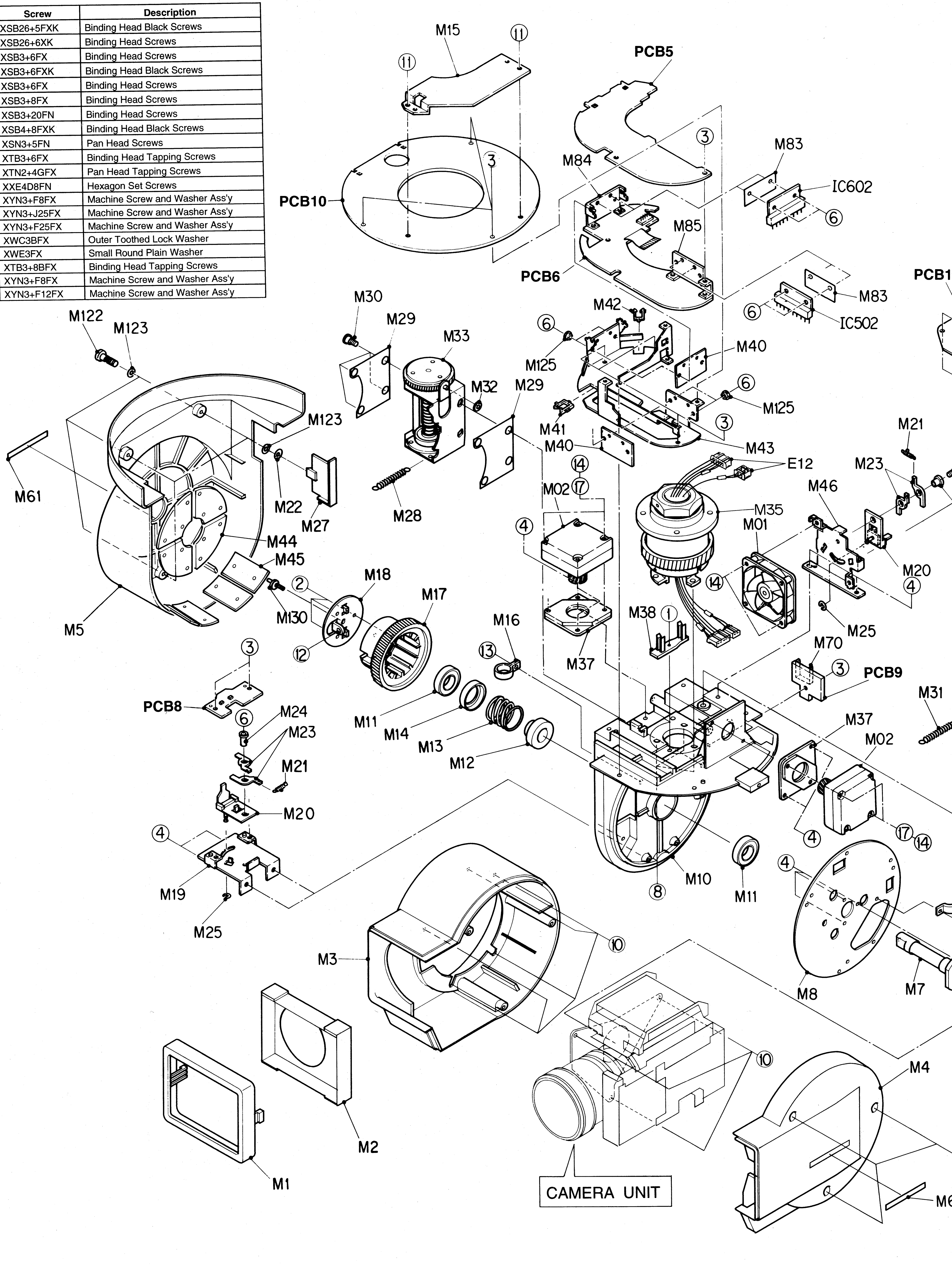
< Index>
POWER SWITCH BOARD

D1	B2
D2	B2

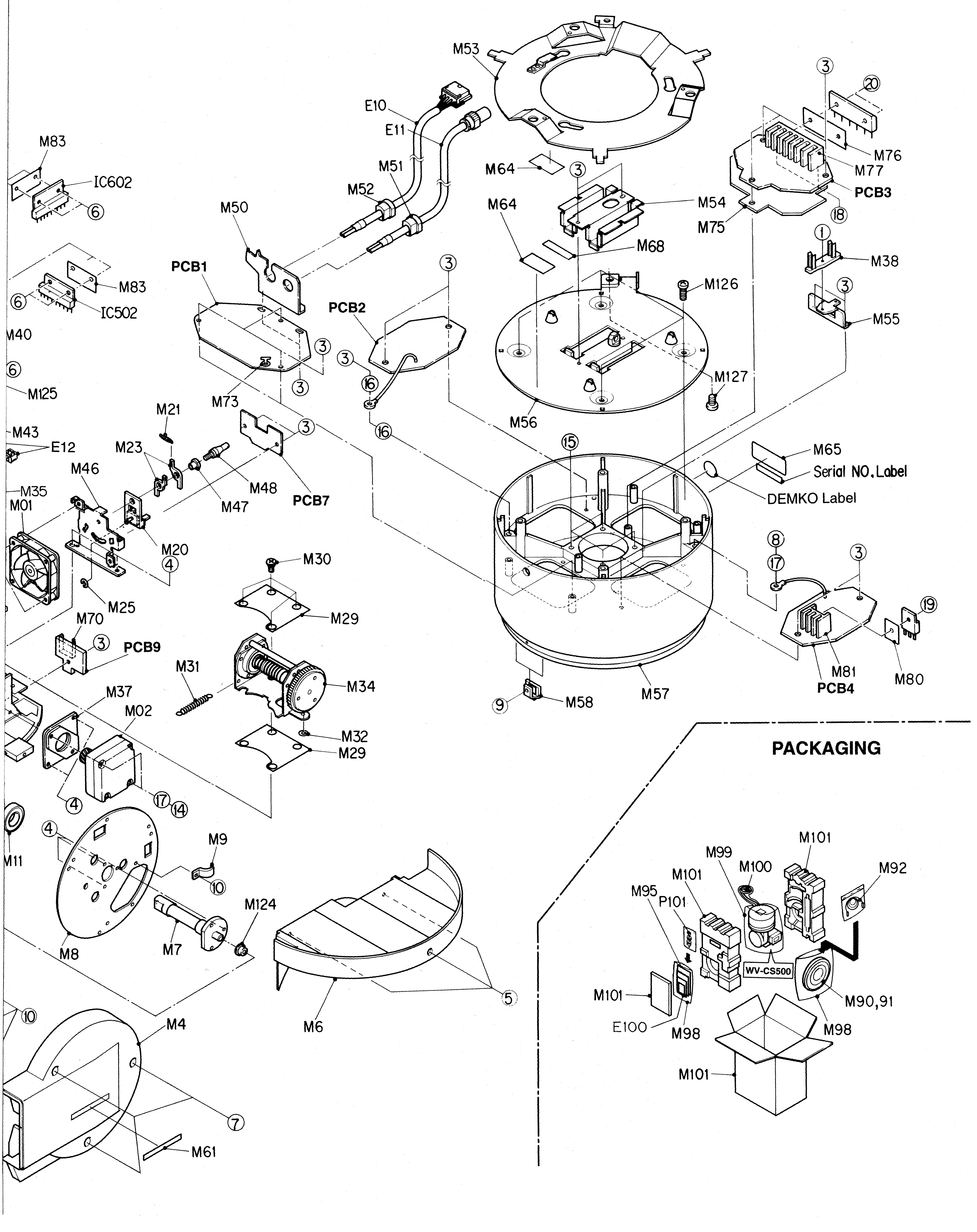
EXPLODED VIEW

○ Numbers show screws, washers, nuts and etc.

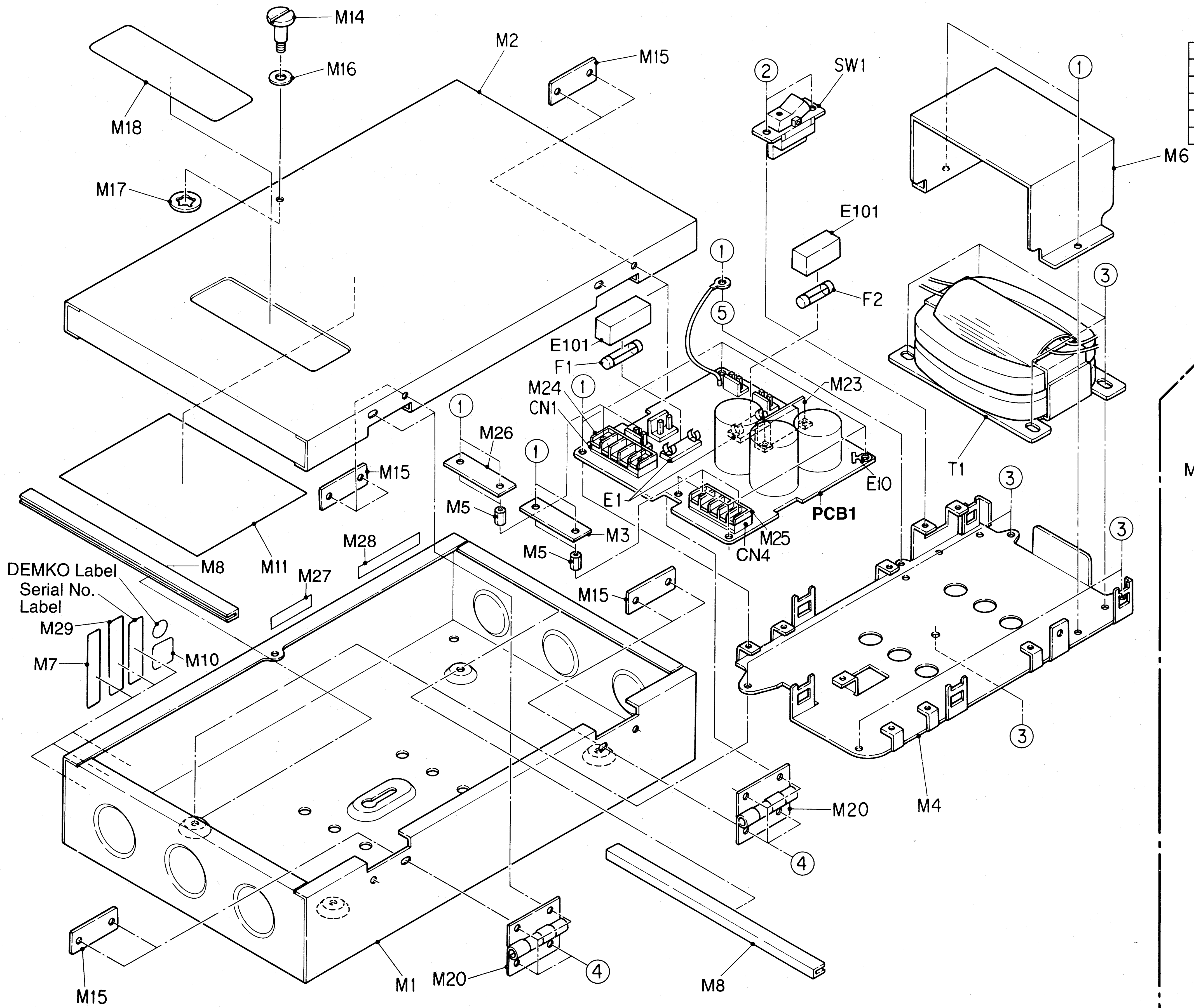
No.	Screw	Description
①	XSB26+5FXK	Binding Head Black Screws
②	XSB26+6XK	Binding Head Screws
③	XSB3+6FX	Binding Head Screws
④	XSB3+6FXK	Binding Head Black Screws
⑤	XSB3+6FX	Binding Head Screws
⑥	XSB3+8FX	Binding Head Screws
⑦	XSB3+20FN	Binding Head Screws
⑧	XSB4+8FXK	Binding Head Black Screws
⑨	XSN3+5FN	Pan Head Screws
⑩	XTB3+6FX	Binding Head Tapping Screws
⑪	XTN2+4GFX	Pan Head Tapping Screws
⑫	XXE4D8FN	Hexagon Set Screws
⑬	XYN3+F8FX	Machine Screw and Washer Ass'y
⑭	XYN3+J25FX	Machine Screw and Washer Ass'y
⑮	XYN3+F25FX	Machine Screw and Washer Ass'y
⑯	XWC3BFX	Outer Toothed Lock Washer
⑰	XWE3FX	Small Round Plain Washer
⑱	XTB3+8BFX	Binding Head Tapping Screws
⑲	XYN3+F8FX	Machine Screw and Washer Ass'y
⑳	XYN3+F12FX	Machine Screw and Washer Ass'y


M15
⑪
⑪
PCB5
③
③
PCB10
M83
M84
IC602
⑥
M85
PCB6
PCB1
M83
⑥
IC502
M30
M29
M33
M32
M29
M42
⑥
M125
M40
⑥
M125
M122
M123
M123
M22
M27
M28
M41
M40
③
M43
M21
M61
⑭
⑰
M02
E12
M23
M46
M35
M01
M44
M45
④
M20
④
M18
M17
②
M130
M5
⑫
M16
⑬
M38
①
⑭
M37
M25
M70
③
PCB9
M31
③
PCB8
⑥
M24
M23
M21
M20
M11
M14
M13
M12
M37
M02
④
⑰
⑭
④
M19
M25
⑧
M10
M11
④
M8
M7
M3
⑩
⑩
M2
M1
M4
CAMERA UNIT
M6

EXPLODED VIEW


M53
E10
E11
M51
M52
M50
M83
IC602
⑥
M83
⑥
IC502
M40
⑥
M125
M43
E12
M35
M01
M46
M21
M23
M47
M48
M20
④
M25
M73
PCB1
③
③
PCB7
③
PCB2
③
⑯
③
⑯
M64
③
M64
M54
M68
M56
M126
M127
③
⑳
M76
M77
PCB3
⑱
M75
①
M38
③
M55
⑮
M65
Serial NO.Label
DEMKO Label
⑧
⑰
③
⑲
M81
PCB4
M80
M57
⑨
M58
M30
M29
M34
M31
M32
M29
M70
③
PCB9
M37
M02
④
⑰⑭
M11
④
M9
⑩
M124
M7
M8
M6
⑤
⑩
M4
⑦
M61
PACKAGING
M101
M99
M100
M92
M101
M95
P101
WV-CS500
M101
M90,91
E100
M98
M98
M101

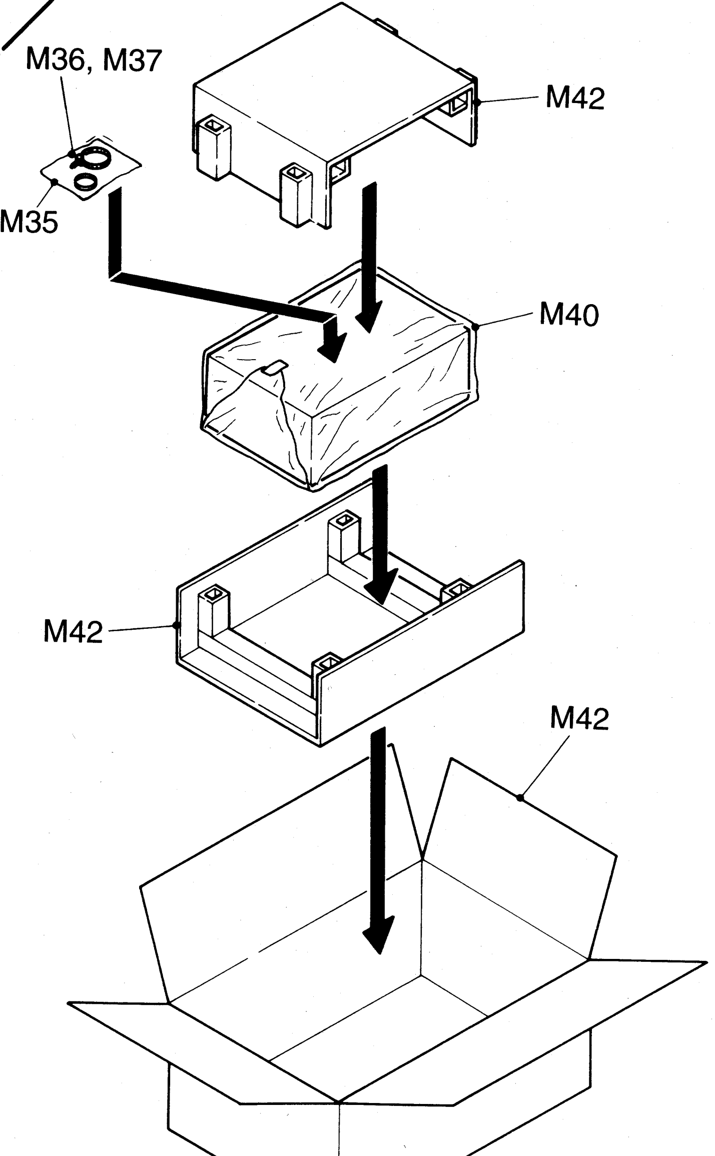
EXPLODED VIEW


M14
M16
M2
M15
M18
M17
SW1
②
①
M6
E101
①
⑤
F2
③
E101
F1
M24
①
CN1
M23
①
M26
①
M15
M5
M3
E1
E10
T1
PCB1
M25
CN4
③
③
M5
M28
DEMKO Label
Serial No. Label
M8
M11
M27
M15
M29
M7
M10
M20
④
M4
③
M15
M1
M20
④
M8

○ Numbers show screws, washers, nuts and etc.

No.	Screw	Description
①	XSB3+6FN	Binding Head Screws
②	XSB26+6FZK	Binding Head Screws
③	XSB4+6FX	Binding Head Screws
④	XST3+6FN	Pan Head Tapping Screws
⑤	XWC4BFN	Outer Toothed Lock Washer

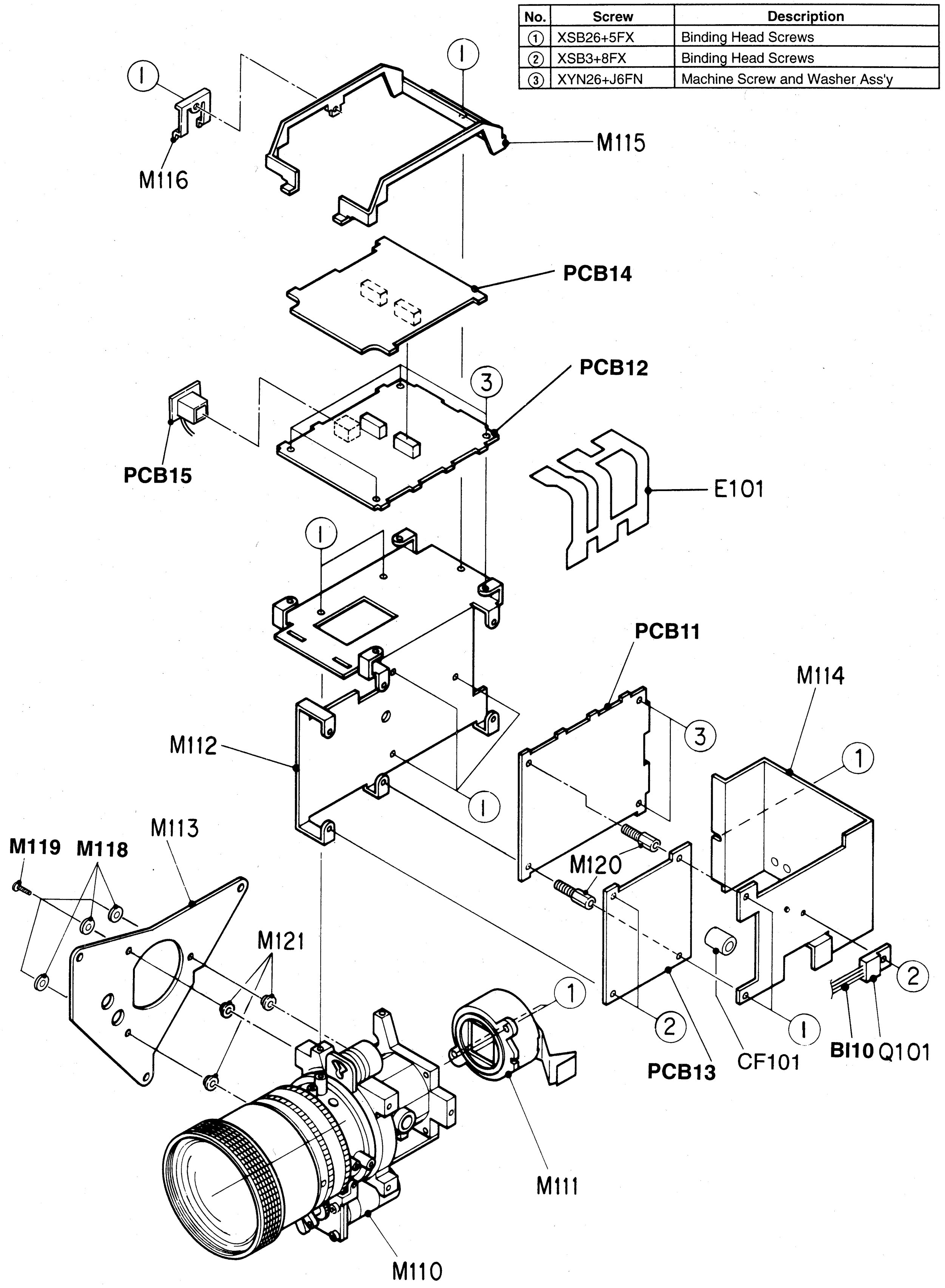
PACKAGING


M36, M37
M42
M35
M40
M42
M42

EXPLODED VIEW

○ Numbers show screws, washers, nuts and etc.

No.	Screw	Description
①	XSB26+5FX	Binding Head Screws
②	XSB3+8FX	Binding Head Screws
③	XYN26+J6FN	Machine Screw and Washer Ass'y



REPLACEMENT PARTS LIST

Important Notice

1. Components identified by " ⚠ " mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
2. RTL : Retention Time Limited.

COMBINATION CAMERA WV-CS500

MISCELLANEOUS

REF.NO.	PART NO.	DESCRIPTION
MO1	YWP0424H608	Fan Motor
MO2	YWV0MA0118AN	DC Motor Assy
E10	YWVCS500L05B	Power Cable Ass'y
E11	YWVCS300L06A	Camera Cable Ass'y
E12	YWVCS500L06A	Curl Cable Assy
BI 1	YWVCS500L27A	Wire Assy for Ref No to Page Wiring Diagram
BI 2	YWVCS500L11A	Wire Assy for Pan Limit Board CN101 and CPU Board CN3
M1	YWV9AA0748A4	Front Escutcheon
M2	YWV5WA1340A3	Front Panel
M3	YWV5KA1179A1	Camera Case
M4	YWV5KA1180A1	Camera Side Cover
M5	YWV5KA1183A1	Tilt Main Case
M6	YWV5KA1184A1	Tilt Sub Case
M7	YWV4HA0184A4	Shaft
M8	YWV2SA2143A3	Mounting Angle for CameraSide
M9	YWV2GA0098A4	Cord Clamp
M10	YWV0MA0140AN	Tilt Main Chassis Assy
M11	YWV4FA0039A4	Bearing
M12	YWV3FA0145A4	Ring for Tilt Spring
M13	YWV4JA0408A4	Spring
M14	YWV3FA0144A4	Tilt Spring Ring
M15	YWV2PA0556A4	Insulator
M16	YWNK4N	Cord Clamp
M17	YWV4EA0039B3	Gear
M18	YWV2CA0350A4	Hold Plate for Tilt
M19	YWV2SB2149A4	Mounting Angle for Tilt Switch
M20	YWV0MA0131AN	Switch Lever(X2)
M21	YWV4JA0447A4	Coil Spring
M22	YWV1CA0019A4	Retaining Ring
M23	YWV4RA0101A4	Lever
M24	YWV3FB0159A4	Tilt Switch Ring
M25	YWV3FA0161A4	E Ring
M27	YWV5KA1181A3	Switch Cover
M28	YWV4JA0454A4	Spring
M29	YWV2NA0387A4	Warm Spacer(X4)
M30	YWE5100EM02	Standard Screw
M31	YWV4JA0406A4	Spring
M32	YWV1KA0173A4	Washer
M33	YWV0MA0120AN	Tilt Warm Assy
M34	YWV0MA0121AN	Pan Warm Assy
M35	YWV0MA0119AN	Pan Shaft Assy
M37	YWV9AA0856A4	Rubber Ass'y
M38	YWV2GA0101A3	Cord Clamp
M40	YWV2PA0555A4	Insulator(X2)
M41	YWV2GA0108A4	Cord Clamp
M42	YFEDS2	Cord Clamp
M43	YWV7DA0347A2	Heat Sink
M44	YWV2FA0634A4	Cushion
M45	YWV2FA0635A4	Cushion
M46	YWV2SA2445A3	Mounting Angle
M47	YWV3FA0159A4	Ring
M48	YWV1EB0245A4	Special Screw
M50	YWV2SA2448A4	Mounting Angle for Cable
M51	YWSR5N4	Cord Clamp
M52	YWSR-6N3-4	Cord Clamp
M53	YWV9AA0858A3	Camera Mounting Angle
M54	YWV6GA0200A3	Push Plate for Cord
M55	YWV2SA2151A4	Mounting Angle
M56	YWV9AA0752A3	Bottom Cover Assy
M57	YWV0MA0130AN	Power Case Assy
M58	YWV4RA0099A4	Lever
M61	YWV5DA0334A4	Ornament
M64	YWV7SA1513A4	Front Label
M65	YWV7QA3439A4	Main Label
M68	YWV7QA2372A4	System Label
M75	YWV2HA1133A4	Shield Plate
M122	YWV1EA0261A4	Special Screw
M123	YWV3FA0160A4	O Ring
M124	YWM6	M6 Bush Spacer
M125	YWV2NA0424A4	Spacer
M126	YWV1EA0258A4	Special Screw
M127	YWV1EE0258A4	Special Screw

POWER SUPPLY BOARD

REF.NO.	PART NO.	DESCRIPTION	
PCB1 (RTL)	YWVKBCS50E3A	Printed Circuit Board Assy	
IC5	YWM75179P	IC	
VS2-5	ERZC03DK220	ZNR	
R9	ERD25FJ101	Carbon	100 ohms 1/4W
R11	ERDS2TJ223	Carbon	22K ohms 1/4W
R12	ERDS2TJ103	Carbon	10K ohms 1/4W
R13,14	ERDS2TJ153	Carbon	15K ohms 1/4W
R15,16	ERDS2TJ202	Carbon	2K ohms 1/4W
C24	YWRPEF104ZNT	Ceramic	0.01 μF
C25	ECQM1H104JZ	Plastic	0.01 μF 50V
L3	ELESE100KA	Coil	
CF21,22	YWDSS306222Z	Filter	
CF27-29	YWDSS306222Z	Filter	
CN1	YW556910A1	Connector	
CN2	YWB2PVH	2-pin Connector	
CN4	YW530140310	3-pin Connector	
CN5	YFS6PS2T2EF	6-pin Connector	
CN6	S2PS2T2EF	2-pin Connector	
E1,2	YVL437TM027	Terminal	
E4	YVL437TM027	Terminal	
E10	YWA2QA0047A4	Electrode	

FILTER BOARD

REF.NO.	PART NO.	DESCRIPTION	
PCB2 (RTL)	YWVKCCS50E3A	Printed Circuit Board Assy	
D1	MA749A	Diode	
SCR1	YWCR8PM8	Thyristor	
VS1	ERZC07DK560	ZNR	
C3	ECQM1H104JZ	Plastic	0.1 μF 50V
C7	ECOS1HA682EB	Electrolytic	6800 μF 50V
CF1,2	YWDSS306222Z	Filter	
F1	YWNT18R0	Current Fuse	
E2	YWVCS500L04A	Wire Assy for +10/+5REG Board E2	
J1,J2	YWATZ220AT02	Wire Assy for Power Supply Board CN2	

+12V REG BOARD

REF.NO.	PART NO.	DESCRIPTION	
PCB3 (RTL)	YWVKDCS50E3A	Printed Circuit Board Assy	
IC1	YWSTR7002	IC	
IC2	YWSI8021	IC	
R1	ERDS2TJ132	Carbon	1.3K ohms 1/4W
R2	ERDS2FJ680	Carbon	68 ohms
R3,4	ERX1SJR33	Metal	0.33 ohms 1W
C8	YWRPEF104ZNT	Ceramic	0.1 μF
C9	ECEA1HGE100	Electrolytic	10 μF 50V
C10	ECKF1H331KB	Ceramic	330 pF 50V
C11	ECA1CFQ392S	Electrolytic	3900 μF 16V
C23	ECA1HFQ100	Electrolytic	10 μF 50V
C26	ECKF1H331KB	Ceramic	330 pF 50V
L2	YWHP054SZ	Coil	
M76	YWA2PA0247A4	Insulator	
M77	YWV7DA0348A4	Heat Sink	

+10V / +5V REG BOARD

REF.NO.	PART NO.	DESCRIPTION	
PCB4 (RTL)	YWVKECS50E3A	Printed Circuit Board Assy	
IC3	YWSI3090C	IC	
IC4	YWNJM78M05FA	IC	
D2	YWMTZ15B	Diode	
R5	ERQ1ABJP2R2S	Fuse Resistor	
R6	ERDS2TJ101	Carbon	100 ohms 1/4W
R7	ERDS2TJ222	Carbon	2.2K ohms 1/4W
R8	ERG1SJ330	Metal	33 ohms 1W
R17	ERDS2FJ151	Carbon	150 ohms 1/4W
VR1	YFH0621A330	Variable Resistor	33 ohms
C12	ECA1CFQ392S	Electrolytic	3900 μF 16V
C13	ECEA1CGE101	Electrolytic	100 μF 16V
C14,15	YWRPEF104ZNT	Ceramic	0.1 μF
C16	ECEA1CGE101	Electrolytic	100 μF 16V
C17	ECEA1CGE470	Electrolytic	47 μF 16V
C18,19	YWRPEF104ZNT	Ceramic	0.1 μF
C20	ECEA0JGE101	Electrolytic	100 μF 6.3V(NHE)
L4	ELESN471KA	Coil	
CN3	S4PS2T2EF	4-pin Connector	
E1	TWATZ307V503	Wire Assy for Power Supply Board CN4	
E3	YVL437TM027	Terminal	
M80	YWAC-256	Insulator	
M81	YWDBA25BSAN0	Heat Sink	

CPU BOARD

REF.NO.	PART NO.	DESCRIPTION	
PCB5 (RTL)	YWVKBCS50J2A	Printed Circuit Board Assy	
IC101	YWM37451SGP	IC	
IC102	YWHN27CS50V6	IC	
IC103	YWHN58C65FP	IC	
IC104	YWTL7705CPBF	IC	
IC105	TL7700CPS	IC	
IC106	YW78L05UATE1	IC	
IC107	YW74F138SJ	IC	
IC108	MC74HC139AF	IC	
IC110	YW74F138SJ	IC	
IC112	YWMC74HC32AF	IC	

REF.NO.	PART NO.	DESCRIPTION	
IC113	MC74HC4538AF	IC	
IC114	MC74HC174AF	IC	
IC115	YWMC74HC04AF	IC	
IC116	YWMC74HC08AF	IC	
IC117	YWMC74HC02AF	IC	
IC118	MC74HC14AF	IC	
IC119	MC74HC240AF	IC	
IC120	NJM2903M	IC	
IC201-203	MC74HC374AF	IC	
IC204	YWNJU8101M	IC	
IC205	NJM3404AM	IC	
IC206	NJM4560M	IC	
IC207	YWHA13490MP	IC	
IC301	MC74HC374AF	IC	
IC302	YWNJU8001M	IC	
IC303	NJM4560M	IC	
IC304	YWHA13490MP	IC	
IC401	NJM3404AM	IC	
IC402	NJM4560M	IC	
IC403	NJM3404AM	IC	
IC404	MC74HC4066F	IC	
IC405	NJM3404AM	IC	
IC406	NJM2903M	IC	
Q101	2SB1132-Q	Transistor	
Q102	DTA114WU	Transistor	
Q103	DTC114WU	Transistor	
Q104	2SA1576	Transistor	
Q105	DTC114WU	Transistor	
Q401-403	2SC4081	Transistor	
D101	YWRB715FT106	Diode	
D102,103	MA110	Diode	
D104	YWRB471E148	Diode	
D105	YWRB715FT106	Diode	
D106	MA8047	Diode	
D107,108	MA110	Diode	
D201,202	MA8033	Diode	
D301,302	MA8033	Diode	
D401	YWRB715FT106	Diode	
R101	ERJ3GEYJ105	Carbon	1M ohms 1/16W
R102	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R103	ERJ3GEYJ223	Carbon	22K ohms 1/16W
R104,105	ERJ3GEYJ224	Carbon	220K ohms 1/16W
R106	YWR0816R154D	Metal	150K ohms 1/16W
R107	YWR0816P752D	Metal	7.5K ohms 1/16W
R108	ERJ12YJ390	Carbon	39 ohms 1/2W
R109	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R110,111	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R112	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R113-118	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R119,120	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R121-124	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R125,126	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R127	ERJ3GEYJ823	Carbon	82K ohms 1/16W
R128	ERJ3GEYJ513	Carbon	51K ohms 1/16W
R129,130	ERJ3GEYJ103	Carbon	10K ohms 1/16W

REF.NO.	PART NO.	DESCRIPTION	
R131,132	ERJ3GEYJ514	Carbon	510K ohms 1/16W
R133-138	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R139	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W
R140	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R142	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R143	ERJ3GEYJ683	Carbon	68K ohms 1/16W
R144	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R201	ERJ3GEYJ822	Carbon	8.2K ohms 1/16W
R202	ERJ3GEYJ474	Carbon	470K ohms 1/16W
R203,204	ERJ3GEYJ824	Carbon	820K ohms 1/16W
R205	ERJ3GEYJ154	Carbon	150K ohms 1/16W
R206	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R207	ERJ3GEYJ124	Carbon	120K ohms 1/16W
R208,209	ERJ14YK2R2	Carbon	2.2 ohms 1/4W
R210,211	ERJ1WYJ150H	Carbon	15 ohms 1W
R212	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R301	ERJ3GEYJ822	Carbon	8.2K ohms 1/16W
R302	ERJ3GEYJ474	Carbon	470K ohms 1/16W
R303,304	ERJ3GEYJ824	Carbon	820K ohms 1/16W
R305	ERJ3GEYJ154	Carbon	150K ohms 1/16W
R306	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R307	ERJ3GEYJ124	Carbon	120K ohms 1/16W
R308,309	ERJ14YK2R2	Carbon	2.2 ohms 1/4W
R310,311	ERJ1WYJ150H	Carbon	15 ohms 1W
R312	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R401,402	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R403	ERJ3GEYJ512	Carbon	5.1K ohms 1/16W
R404	ERJ14YJ221	Carbon	220 ohms 1/4W
R405,406	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R407	ERJ3GEYJ512	Carbon	5.1K ohms 1/16W
R408	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R409	ERJ3GEYJ225	Carbon	2.2M ohms 1/16W
R410,411	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R412,413	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R414	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R415	ERJ3GEYJ225	Carbon	2.2M ohms 1/16W
R416,417	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R418-421	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R422,423	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R424-427	ERJ3GEYJ105	Carbon	1M ohms 1/16W
Z101-104	EXBV8V103J	Block Resistor	
Z105	EXBV8V102J	Block Resistor	
Z106,107	EXBV8V103J	Block Resistor	
Z201	EXBV8V104J	Block Resistor	
Z301	EXBV8V334J	Block Resistor	
C101,102	YW5CH101J5VB	Ceramic	100 pF
C103-105	YW5CH221J5VB	Ceramic	220 pF
C106	ECEV0JV220	Electrolytic	22 µF 6.3V
C107-110	YW5F104Z2VB	Ceramic	0.1 µF
C111	ECST1AY475	Electrolytic	4.7 µF 10V
C112	YW5F104Z2VB	Ceramic	0.1 µF
C113	ECHU1C104JB	Plastic	0.1 µF
C114-116	YW5F104Z2VB	Ceramic	0.1 µF
C117	ECEV0JV220	Electrolytic	22 µF 6.3V
C118	YW5F104Z2VB	Ceramic	0.1 µF

REF.NO.	PART NO.	DESCRIPTION	
C119	ECEV0JV220	Electrolytic	22 µF 6.3V
C120	ECEV1CV100	Electrolytic	10 µF 16V
C121	ECEA0JGE102	Electrolytic	1000 µF 6.3V
C122	YW5F104Z2VB	Ceramic	0.1 µF
C123-126	YW5X103K2VB	Ceramic	0.01 µF
C127	YW5F104Z2VB	Ceramic	0.1 µF
C128	ECEA1CGE221	Electrolytic	220 µF 16V
C129,130	YW5F104Z2VB	Ceramic	0.1 µF
C131	ECEV0JV220	Electrolytic	22 µF 6.3V
C132-141	YW5F104Z2VB	Ceramic	0.1 µF
C142	ECEA0JGE102	Electrolytic	1000 µF 6.3V
C143,144	YW5F104Z2VB	Ceramiµc	0.1 µF
C145	YW5CH101J5VB	Ceramic	100 pF
C146	YW5F104Z2VB	Ceramic	0.1 µF
C201,202	ECHU1C104JB	Plastic	0.1 µF
C203	YW5CH561J5VB	Ceramic	560 pF
C204,205	ECEV1CV100	Electrolytic	10 µF 16V
C206	ECEV1CV470SP	Electrolytic	47 µF 16V
C207-212	YW5F104Z2VB	Ceramic	0.1 µF
C213,214	ECHU1C104JB	Plastic	0.1 µF
C215	YW5CH101J5VB	Ceramic	100 pF
C216	ECHU1C563JB	Plastic	0.056 µF
C301,302	ECHU1C104JB	Plastic	0.1 µF
C303	YW5CH561J5VB	Ceramic	560 pF
C304,305	ECEV1CV100	Electrolytic	10 µF 16V
C306	ECEV1CV470SP	Electrolytic	47 µF 16V
C307-309	YW5F104Z2VB	Ceramic	0.1 µF
C310,311	ECHU1C104JB	Plastic	0.1 µF 16V
C312	YW5CH101J5VB	Ceramic	100 pF
C313	ECHU1C104JB	Plastic	0.1 µF
C401-405	YW5F104Z2VB	Ceramic	0.1 µF
C406	ECHU1C103JB	Plastic	0.01 µF
C407	YW5F104Z2VB	Ceramic	0.1 µF
C408	ECHU1C103JB	Plastic	0.01 µF
C409,410	YW5F104Z2VB	Ceramic	0.1 µF
C411	ECST1AY225ZR	Electrolytic	2.2 µF 10V
C412	YW5F104Z2VB	Ceramic	0.1 µF
L101	YWBLM32A07PT	Coil	
L102-104	F2012C330KT	Coil	33 µH
X101	YWCSA10MTZ04	Oscillator	
CN2	YW520302210	22-pin Connector	
CN3,4	YW530470410	4-pin Connector	
CN5	YW530471010	10-pin Connector	
E1	YWMBY410MC14	Wire Assy for Receiver Board CN1	

REF.NO.	PART NO.	DESCRIPTION	
CONTROL BOARD			
PCB6	YWVKCCS50J2A	Printed Circuit Board Assy	
IC501	YWM52838FP	IC	
IC502	YWHA13441V	IC	
IC503,504	NJM3404AM	IC	
IC505	NJM2903M	IC	
IC506	MC74HC374AF	IC	
IC507	NJM2903M	IC	
IC601	YWM52838FP	IC	
IC602	YWHA13441V	IC	
IC603,604	NJM3404AM	IC	
IC605	NJM2903M	IC	
IC606	MC74HC374AF	IC	
IC607	NJM2903M	IC	
IC701	YW78L05UATE1	IC	
IC702	YWHD74HC123F	IC	
IC703	MC74HC374AF	IC	
IC704	MC74HC245AF	IC	
IC705	YWMC74HC00AF	IC	
IC706	MC74HC14AF	IC	
IC707,708	YWMC74HC00AF	IC	
IC709	YWMC74HC86F	IC	
IC801	NJM2903M	IC	
Q501,601	2SA1576	Transistor	
Q801	2SB1132-Q	Transistor	
D501	YWRB471E148	Diode	
D502	MA110	Diode	
D601	YWRB471E148	Diode	
D602	MA110	Diode	
TH801	ERTD2ZHJ103S	Thermistor	
R501,502	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R503,504	YWR0816P103D	Metal	10K ohms 1/16W
R505	YWR0816R184D	Metal	180K ohms 1/16W
R506,507	YWR0816P333D	Metal	33K ohms 1/16W
R508	ERJ3GEYJ154	Carbon	150K ohms 1/16W
R509,510	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R511	ERJ3GEYJ333	Carbon	33K ohms 1/16W
R512	ERJ3GEYJ104	Carbon	100K ohms 1/16W
R513	ERJ3GEYJ433	Carbon	43K ohms 1/16W
R514	ERJ3GEYJ394	Carbon	390K ohms 1/16W
R515,516	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R517	ERJ3GEYJ183	Carbon	18K ohms 1/16W
R518	ERJ3GEYJ274	Carbon	270K ohms 1/16W
R519-528	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R529	ERJ14YK2R7	Carbon	2.7 ohms 1/4W
R530	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R531	YF2116152JT	Carbon	1.5K ohms 1/10W
R532-534	ERJ14YK2R2	Carbon	2.2 ohms 1/4W
R535	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R536	ERJ3GEYJ512	Carbon	5.1K ohms 1/16W
R537,538	ERJ3GEYJ103	Carbon	10K ohms 1/16W

REF.NO.	PART NO.	DESCRIPTION	
R539	ERJ3GEYJ274	Carbon	270K ohms 1/16W
R540	ERJ3GEYJ512	Carbon	5.1K ohms 1/16W
R541	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R542	ERJ3GEYJ274	Carbon	270K ohms 1/16W
R543	ERJ3GEYJ512	Carbon	5.1K ohms 1/16W
R544	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R545	ERJ3GEYJ105	Carbon	1M ohms 1/16W
R546	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R547,548	ERJ3GEYJ563	Carbon	56K ohms 1/16W
R549,550	ERJ14YK2R7	Carbon	2.7 ohms 1/4W
R551	ERJ3GEYJ244	Carbon	240K ohms 1/16W
R552	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R553	YWR0816P121D	Metal	120 ohms 1/16W
R601,602	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R603,604	YWR0816P103D	Metal	10K ohms 1/16W
R605	YWR0816R184D	Metal	180K ohms 1/16W
R606,607	YWR0816P333D	Metal	33K ohms 1/16W
R608	ERJ3GEYJ154	Carbon	150K ohms 1/16W
R609,610	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R611	ERJ3GEYJ333	Carbon	33K ohms 1/16W
R612	ERJ3GEYJ104	Carbon	100K ohms 1/16W
R613	ERJ3GEYJ433	Carbon	43K ohms 1/16W
R614	ERJ3GEYJ394	Carbon	390K ohms 1/16W
R615,616	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R617	ERJ3GEYJ183	Carbon	18K ohms 1/16W
R618	ERJ3GEYJ274	Carbon	270K ohms 1/16W
R619-628	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R629	ERJ14YK2R7	Carbon	2.7 ohms 1/4W
R630	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R631	YF2116152JT	Carbon	1.5K ohms 1/10W
R632-634	ERJ14YK2R2	Carbon	2.2 ohms 1/4W
R635	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R636	ERJ3GEYJ512	Carbon	5.1K ohms 1/16W
R637,638	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R639	ERJ3GEYJ274	Carbon	270K ohms 1/16W
R640	ERJ3GEYJ512	Carbon	5.1K ohms 1/16W
R641	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R642	ERJ3GEYJ274	Carbon	270K ohms 1/16W
R643	ERJ3GEYJ512	Carbon	5.1K ohms 1/16W
R644	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R645	ERJ3GEYJ105	Carbon	1M ohms 1/16W
R646	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R647,648	ERJ3GEYJ563	Carbon	56K ohms 1/16W
R649,650	ERJ14YK2R7	Carbon	2.7 ohms 1/4W
R651	ERJ3GEYJ244	Carbon	240K ohms 1/6W
R652	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R653	YWR0816P121D	Metal	120 ohms 1/16W
R701	ERJ14YJ221	Carbon	220 ohms 1/4W
R702	YF2116621JT	Carbon	620 ohms 1/10W
R703,704	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R705-708	ERJ3GEYJ104	Carbon	100K ohms 1/16W
R711,712	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R713-715	ERJ3GEYJ121	Carbon	120 ohms 1/16W
R801	YWR0816P101D	Metal	100 ohms 1/16W
R802	YWR0816P332D	Metal	3.3K ohms 1/16W

REF.NO.	PART NO.	DESCRIPTION	
R803	YWR0816P472D	Metal	4.7K ohms 1/16W
R804	YWR0816P561D	Metal	560 ohms 1/16W
R805,806	YWR0816P102D	Metal	1K ohms 1/16W
R807	YWR0816P103D	Metal	10K ohms 1/16W
R808	ERJ3GEYJ105	Carbon	1M ohms 1/16W
R809	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R810,811	ERJ3GEYJ512	Carbon	5.1K ohms 1/16W
Z501	EXBM16V223JA	Block Resistor	
Z502	EXBV8V103J	Block Resistor	
Z601	EXBM16V223JA	Block Resistor	
Z602	EXBV8V103J	Block Resistor	
C501,502	YW5F104Z2VB	Ceramic	0.1 µF
C503,504	YW5CH331J5VB	Ceramic	330 pF
C505	YW5CH181J5VB	Ceramic	180 pF
C506	ECHU1H272JB	Plastic	2700 pF 50V
C507	ECHU1C273JB	Plastic	0.027 µF16V
C508	YW5CH331J5VB	Ceramic	330 pF
C509	ECHU1C104JB	Plastic	0.1 µF 16V
C510	ECHU1C562JB	Plastic	5600 pF16V
C511	YW5X102K5VB	Ceramic	1000 pF
C512-514	YW5F104Z2VB	Ceramic	0.1 µF
C515	YW5CH331J5VB	Ceramic	330 pF
C516	YW5X102K5VB	Ceramic	1000 pF
C517	YW5F104Z2VB	Ceramic	0.1 µF
C518	ECEV1CV470	Electrolytic	47 µF 16V
C519-521	ECEV1EN3R3S	Electrolytic	3.3 µF 25V
C522-527	YW5F104Z2VB	Ceramic	0.1 µF
C529	ECHU1C273JB	Plastic	0.027 µF 16V
C601,602	YW5F104Z2VB	Ceramic	0.1 µF
C603,604	YW5CH331J5VB	Ceramic	330 pF
C605	YW5CH181J5VB	Ceramic	180 pF
C606	ECHU1H272JB	Plastic	2700 pF 50V
C607	ECHU1C273JB	Plastic	0.027 µF 16V
C608	YW5CH331J5VB	Ceramic	330 pF
C609	ECHU1C104JB	Plastic	0.1 µF16V
C610	ECHU1C562JB	Plastic	5600 pF 16V
C611	YW5X102K5VB	Ceramic	1000 pF
C612-614	YW5F104Z2VB	Ceramic	0.1 µF
C615	YW5CH331J5VB	Ceramic	330 pF
C616	YW5X102K5VB	Ceramic	1000 pF
C617	YW5F104Z2VB	Ceramic	0.1 µF
C618	ECEV1CV470	Electrolytic	47 µF16V
C619-621	ECEV1EN3R3S	Electrolytic	3.3 µF 25V
C622-627	YW5F104Z2VB	Ceramic	0.1 µF
C629	ECHU1C273JB	Plastic	0.027 µF16V
C701	ECEV1CV470	Electrolytic	47 µF16V
C702	YW5F104Z2VB	Ceramic	0.1 µF
C703	ECEV0JV330	Electrolytic	33 µF 6.3V
C704	YW5F104Z2VB	Ceramic	0.1 µF
C705-710	YW5CH221J5VB	Ceramic	220 pF
C711-718	YW5F104Z2VB	Ceramic	0.1 µF
C719,720	YW5CH221J5VB	Ceramic	220 pF
C721,722	ECEA0JGE102	Electrolytic	1000 µF 6.3V
C723-725	YW5CH221J5VB	Ceramic	220 pF
C801,802	YW5F104Z2VB	Ceramic	0.1 µF

REF.NO.	PART NO.	DESCRIPTION	
L701	YWNL32100J	Coil	10 µH
L702,703	YFBL02RN2R62	Coil	
CN6	YWLY2012DTP1	12-pin Connector	
CN7	YWLY2012DLP1	12-pin Connector	
CN8	S4PS2T2EF	4-pin Connector	
CN9	YW530150210	2-piin Connector	
E1	YWVCS500L14A	Wire Assy for CPU Board CN2	
M83	YWV2PA0554A4	Insulator Sheet	
M84	YWV7DA0349A4	Heat Sink	
M85	YWV7DA0350A4	Heat Sink	

PAN-LIMIT BOARD

REF.NO.	PART NO.	DESCRIPTION	
PCB7 (RTL)	YWVKDCS50J2A	Printed Circuit Board Assy	
IC101,102	NJM2904M	IC	
IC103	NJM2903M	IC	
Q103	2SC4081	Transistor	
D101	MA8033	Diode	
VS101,102	YWHW101ASFT	Semiconductor	
R101,102	ERJ6GEYG223	Carbon	22K ohms 1/10W
R103,104	ERJ6GEYG274	Carbon	274K ohms 1/10W
R105	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R106	ERJ3GEYJ225	Carbon	2.2M ohms 1/16W
R108,109	ERJ6GEYG223	Carbon	22K ohms 1/10W
R110,111	ERJ6GEYG274	Carbon	274K ohms 1/10W
R112	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R113	ERJ3GEYJ225	Carbon	2.2M ohms 1/16W
R115	ERJ6GEYG122	Carbon	1.2K ohms 1/10W
R116	ERJ6GEYG152	Carbon	1.5K ohms 1/10W
R117	ERJ3GEYJ102	Carbon	1K ohms 1/16W
C101	YW5F104Z2VB	Ceramic	0.1 µF
C102	ECST1AB106	Tantalum	10 µF 10V
C103-105	YW5F104Z2VB	Ceramic	0.1 µF
C106,107	YW5CH151J5VB	Ceramic	150 pF
CN101	YW530480410	4-pin Connector	

TILT-LIMIT BOARD

REF.NO.	PART NO.	DESCRIPTION	
PCB8 (RTL)	YWVKECS50J2A	Printed Circuit Board Assy	
IC201,202	NJM2904M	IC	
IC203	NJM2903M	IC	
Q203	2SC4081	Transistor	
D201	MA8033	Diode	
VS201,202	YWHW101ASFT	Semiconductor	
R201,202	ERJ6GEYG223	Carbon	22K ohms 1/10W
R203,204	ERJ6GEYG274	Carbon	270K ohms 1/10W
R205	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R206	ERJ3GEYJ225	Carbon	2.2M ohms 1/16W
R208,209	ERJ6GEYG223	Carbon	22K ohms 1/10W
R210,211	ERJ6GEYG274	Carbon	270K ohms 1/10W
R212	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R213	ERJ3GEYJ225	Carbon	2.2M ohms 1/16W
R215	ERJ6GEYG122	Carbon	1.2K ohms 1/10W
R216	ERJ6GEYG152	Carbon	1.5K ohms 1/10W
R217	ERJ3GEYJ102	Carbon	1K ohms 1/16W
C201	YW5F104Z2VB	Ceramic	0.1 µF
C202	ECST1AB106	Electrolytic	10 µF 10V
C203-205	YW5F104Z2VB	Ceramic	0.1 µF
C206,207	YW5CH151J5VB	Ceramic	150 pF
CN201	YW530480410	4-pin Connector	

LED BOARD

REF.NO.	PART NO.	DESCRIPTION	
PCB9 (RTL)	YWVKFCS50J2A	Printed Circuit Board Assy	
D100	LN086WP38	LED	
D101,102	YWDA114	Diode	
D103	YWDAN202U	Diode	
SW101	YWBSS4A	Slide Switch	
E102	YWELZ116V511	Wire Assy for Receiver Board CN6	
M70	YWV2HA1102A4	Shield Caver	

RECIEVER BOARD

REF.NO.	PART NO.	DESCRIPTION
PCB10 (RTL)	YWVKZCS50E1A	Printed Circuit Board Assy
IC1,2	YWMC74HC02AF	IC
IC3	YWMC14069UBF	IC
IC4	YWCF37808PG	LSI
IC5	YWD78218A533	LSI
IC6	YWMC14081BF	IC
IC7	YWTC4S69F	IC
IC8	YWM6M80021FP	IC
IC9	M51951ASL	IC
IC10	YWTC7S32FL	IC
IC11	YWUPC78N05H	IC
IC12	YWTC7S08F	IC
IC17	MC74HC595AF	IC
IC18	M51951ASL	IC
Q1	2SA1037-QRS	Transistor
Q2	DTC114EU	Transistor
Q3	2SB909	Transistor
Q4,5	2SC2412-QRS	Transistor
Q6	2SC3802	Transistor
Q7,12	2SA1576	Transistor
Q13	2SC3802	Transistor
Q14	2SA1733	Transistor
Q15,16	2SC4081	Transistor
Q17	IMZ1T9	Transistor
Q19	2SA1576	Transistor

REF.NO.	PART NO.	DESCRIPTION	
Q20	IMT1T10	Transistor	
Q22	IMX3T9	Transistor	
Q24,25	2SC2412-QRS	Transistor	
Q26	2SA1576	Transistor	
Q27	IMZ1T9	Transistor	
Q29	2SC4081	Transistor	
Q30	2SC4776	Transistor	
Q31	2SA937	Transistor	
Q32,34	IMZ1T9	Transistor	
Q36	IMX3T9	Transistor	
Q37	2SC3802	Transistor	
Q39,41	IMZ1T9	Transistor	
Q43	IMX3T9	Transistor	
Q45	IMZ1T9	Transistor	
Q47,48	2SC4776	Transistor	
Q49	IMX3T9	Transistor	
Q51	IMZ1T9	Transistor	
Q53	2SC4081	Transistor	
Q54	2SC2412-QRS	Transistor	
Q55	2SA1037-QRS	Transistor	
Q56,58	IMZ1T9	Transistor	
D1	YWDA114	Diode	
D3	SLH38MC	LED	
D6,28	YWDA114	Diode	
D29,30	YWDA114	Diode	
D31	YWDAN202U	Diode	
D33-36	YWDA114	Diode	
R1	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R2,5	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R6	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R7	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R8	YF2116471JT	Carbon	470 ohms 1/10W
R9	YF2116681JT	Carbon	680 ohms 1/10W
R11,12	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R13	YF2116681JT	Carbon	680 ohms 1/10W
R16	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R19,22	ERJ3GEYJ333	Carbon	33K ohms 1/16W
R23-25	ERJ3GEYJ333	Carbon	33K ohms 1/16W
R27	ERJ3GEYJ333	Carbon	33K ohms 1/16W
R28	YF2116681JT	Carbon	680 ohms 1/10W
R29	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R36	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R37	ERJ3GEYJ105	Carbon	1M ohms 1/16W
R38	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R39	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R43	ERJ3GEYJ223	Carbon	22K ohms 1/16W
R56,57	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R62	ERJ3GEYJ560	Carbon	56 ohms 1/16W
R63	ERJ3GEYJ223	Carbon	22K ohms 1/16W
R64	ERJ3GEYJ682	Carbon	6.8K ohms 1/16W
R65	ERJ3GEYJ332	Carbon	3.3K ohms 1/16W
R66	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R67	YWR1220P561D	Metal	560 ohms
R68	YWR1220P911D	Metal	910 ohms
R69	ERJ3GEYJ560	Carbon	56 ohms 1/16W

REF.NO.	PART NO.	DESCRIPTION	
R70	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R71	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W
R72	ERJ3GEYJ332	Carbon	3.3K ohms 1/16W
R73	ERJ3GEYJ561	Carbon	560 ohms 1/16W
R74	ERJ3GEYJ560	Carbon	56 ohms 1/16W
R75	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R76	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R77	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R78	ERJ14YJ102	Carbon	1K ohms 1/16W
R79,80	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R81	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W
R82	R1220P621D	Metal	620 ohms
R83	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R84	ERJ3GEYJ332	Carbon	3.3K ohms 1/16W
R85	YWR1220P102D	Metal	1K ohms
R86	ERJ3GEYJ221	Carbon	220 ohms 1/16W
R87	YWR1220P102D	Metal	1K ohms
R88	ERJ3GEYJ301	Carbon	300 ohms 1/16W
R89	YWR1220P152D	Metal	1.5K ohms
R90	ERJ3GEYJ562	Carbon	5.6K ohms 1/16W
R91	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R92	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R93	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R94	ERJ3GEYJ270	Carbon	27 ohms 1/16W
R95	ERJ3GEYJ332	Carbon	3.3K ohms 1/16W
R96,97	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W
R98,99	YF21162R2JT	Carbon	2.2 ohms 1/10W
R100	YW2116620JT	Carbon	62 ohms 1/10W
R101	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R102	YF2116100JT	Carbon	10 ohms 1/10W
R103	ERJ6GEYJ102	Carbon	1K ohms 1/10W
R105	ERJ3GEYJ563	Carbon	56K ohms 1/16W
R106	ERJ3GEYJ224	Carbon	220K ohms 1/16W
R107	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R108,109	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R110	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W
R111	ERJ3GEYJ561	Carbon	560 ohms 1/16W
R112	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R113	R1220P822D	Metal	8.2K ohms
R114	YWR1220P221D	Metal	220 ohms
R115	YFR1220P222D	Metal	2.2K ohms
R116	YF2116561JT	Carbon	560 ohms 1/10W
R117	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R118	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W
R119	YF2116391JT	Carbon	390 ohms 1/10W
R120	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R121	ERJ3GEYJ123	Carbon	12K ohms 1/16W
R122,123	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R124	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W
R125	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R126	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R127	ERJ3GEYJ332	Carbon	3.3K ohms 1/16W
R128	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R129	ERJ3GEYJ563	Carbon	56K ohms 1/16W
R130	ERJ3GEYJ103	Carbon	10K ohms 1/16W

REF.NO.	PART NO.	DESCRIPTION	
R131	ERJ3GEYJ332	Carbon	3.3K ohms 1/16W
R132	ERJ3GEYJ223	Carbon	22K ohms 1/16W
R133	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R134	ERJ3GEYJ332	Carbon	3.3K ohms 1/16W
R135	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R136	ERJ3GEYJ153	Carbon	15K ohms 1/16W
R137	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R138	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R139	ERJ3GEYJ432	Carbon	4.3K ohms 1/16W
R140	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R141	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R142	YF2116100JT	Carbon	10 ohms 1/10W
R143	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R144	YW2116620JT	Carbon	62 ohms 1/10W
R145	ERJ14YJ101	Carbon	100 ohms 1/4W
R146	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R147	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R148	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W
R149	YF2116152JT	Carbon	1.5K ohms 1/10W
R150	ERJ3GEYJ471	Carbon	470 ohms 1/16W
R152	ERJ3GEYJ122	Carbon	1.2K ohms 1/16W
R153	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R154	ERJ3GEYJ272	Carbon	2.7K ohms 1/16W
R155	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R156	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W
R157,158	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R159	ERJ6GEYJ102	Carbon	1K ohms 1/10W
R160	ERJ3GEYJ560	Carbon	56 ohms 1/16W
R161	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R162	YF2116331JT	Carbon	330 ohms 1/10W
R163	ERJ3GEYJ221	Carbon	220 ohms 1/16W
R164	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R165	YF2116221JT	Carbon	220 ohms 1/10W
R166	ERJ3GEYJ332	Carbon	3.3K ohms 1/16W
R167	ERJ3GEYJ223	Carbon	22K ohms 1/16W
R168	ERJ3GEYJ682	Carbon	6.8K ohms 1/16W
R169	ERJ3GEYJ560	Carbon	56 ohms 1/16W
R170	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R187,188	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R189	YF2116220JT	Carbon	22 ohms 1/10W
R190	ERJ3GEYJ223	Carbon	22K ohms 1/16W
R191	ERJ6GEYJ102	Carbon	1K ohms 1/10W
R192	YF2116122JT	Carbon	1.2K ohms 1/10W
R193	ERJ3GEYJ103	Carbon	10K ohms 1/16W
C1	YF400104FZT	Ceramic	0.1 µF
C2	ECEV1CV470SP	Electrolytic	47 µF 16V
C3,4	ECEA0JGE102	Electrolytic	1000 µF 6.3V
C5	YF400104FZT	Ceramic	0.1 µF
C6	YW5CH330J5VB	Ceramic	33 pF
C7	YF400104FZT	Ceramic	0.1 µF
C8	ECEV0JV101	Electrolytic	100 µF 6.3V
C9	YF400104FZT	Ceramic	0.1 µF
C10	YW5CH330J5VB	Ceramic	33 pF
C11	YF400104FZT	Ceramic	0.1 µF
C14	YF400103XKT	Ceramic	0.01 µF

REF.NO.	PART NO.	DESCRIPTION	
C15,16	YW400160CHJT	Ceramic	16 pF 50V
C17-20	YW5CH221J5VB	Ceramic	220 pF
C21	ECEA1CGE101	Electrolytic	100 µF 16V
C22	YW5CH330J5VB	Ceramic	33 pF
C23	ECEV1CV470SP	Electrolytic	47 µF 6.3V
C24	ECEA1CN100S	Electrolytic	10 µF 16V
C25	YW5CH131J5VB	Ceramic	130 pF
C26	YW5CH330J5VB	Ceramic	33 pF
C27	ECEA1CGE471	Electrolytic	470 µF 16V
C28	YW5CH470J5VB	Ceramic	47 pF
C29	ECEV1CV100	Electrolytic	10 µF 16V
C30	ECEV1CV470SP	Electrolytic	47 µF 16V
C31	ECEA1CGE101	Electrolytic	100 µF 16V
C32	YW5CH100J5VB	Ceramic	10 pF
C33	YW5CH090D5VB	Ceramic	7 pF
C34,35	ECEV1CV100	Electrolytic	10 µF 16V
C36,37	ECEA1CGE471	Electrolytic	470 µF 16V
C38	YW5CH101J5VB	Ceramic	100 pF
C39	ECEV1CV220	Electrolytic	22 µF 16V
C40	YF400331CHJT	Ceramic	330 pF
C41-43	ECEV1CV470SP	Electrolytic	47 µF 16V
C44	YF400104FZT	Ceramic	0.1 µF
C45	YF400471CHJT	Ceramic	470 pF
C46,47	ECEV1CV470SP	Electrolytic	47 µF 16V
C48	ECEV1CV100	Electrolytic	10 µF 16V
C49	YF400331CHJT	Ceramic	330 pF
C50,51	YF400104FZT	Ceramic	0.1 µF
C52,53	ECEA1CGE471	Electrolytic	470 µF 16V
C54	ECEV1CV100	Electrolytic	10 µF 16V
C55	YW5CH200J5VB	Ceramic	20 pF
C56	ECEV1CV470SP	Electrolytic	47 µF 16V
C57	YF400104FZT	Ceramic	0.1 µF
C58	YW5CH101J5VB	Ceramic	100 pF
C59	YW5CH131J5VB	Ceramic	130 pF
C60	YF400104FZT	Ceramic	0.1 µF
C61	YW5CH240J5VB	Ceramic	24 pF 50V
C62	YW5CH330J5VB	Ceramic	33 pF
C63	YF400222XKT	Ceramic	2200 pF
C64	ECEA1CGE101	Electrolytic	100 µF 16V
C65	ECEV1CV470SP	Electrolytic	47 µF 16V
C66	ECEA0JGE102	Electrolytic	1000 µF 6.3V
C67	ECEA1CGE471	Electrolytic	470 µF 16V
C68	ECEA0JGE471	Electrolytic	470 µF 6.3V
C80	YW5X103K2VB	Ceramic	0.01 µF
C81	ECEV1CV470SP	Electrolytic	47 µF 16V
C83-85	ECEA0JGE102	Electrolytic	1000 µF 6.3V
C86,87	YW5X103K2VB	Ceramic	0.01 µF
C88	ECEA1CGE471	Electrolytic	470 µF 16V
C91	YW5X103K2VB	Ceramic	0.01 µF
L1	YWNL45100J	Coil	10 µH
L2-4	YWNL45101J	Coil	100 µH
L5	YWNL45100J	Coil	10 µH
L6	YWNL458R2J	Coil	8.2 µH
L7	YWNL454R7J	Coil	4.7 µH
L8	YWNL32220J	Coil	22 µH

REF.NO.	PART NO.	DESCRIPTION
X1	EF0EC4004A4	Crystal Oscillator
X2	YWDSHC11M05	Crystal Oscillator
CF1	ELB4M081	Filter
CN1	YW530471410	14-pin Connector
CN2	S2PS2T2EF	2-pin Connector
CN3	YW530140410	4-pin Connector
CN4	YW530470410	4-pin Connector
CN5	YFS6PS2T2EF	6-pin Connector
CN6	YW530141110	11-pin Connector

CAMERA UNIT

MISCELLANEOUS

REF.NO.	PART NO.	DESCRIPTION
Q101	2SB941-PQR	Transistor
CF101	YW2643625002	Feright Bees
E101	YWCL320	Flexible Board
BI10	PHS1060SHX03	Internal Wire Assy for Q101 and Power Board CN4
M110	YWYPEFP	Lens Assy
M111	YWVAKA1336AN	Optical Head ASSY
M112	YWV2SA2145B3	Mounting Angle
M113	YWV2SA2147A3	Mounting Angle
M114	YWV2SA2144A3	Mounting Angle
M115	YWV2SA2455A3	Mounting Angle
M116	YWV4JA0448A4	Spring
M118	YWA2HA0197A4	Shield Parts
M119	YWV1EJ0258A4	Special Screw
M120	YWV1EA0260A4	Stud
M121	YWV2NB0424A4	Spacer

DRIVE BOARD

REF.NO.	PART NO.	DESCRIPTION
PCB11 (RTL)	YWVKBCS50E1A	Printed Circuit Board Assy
IC1	YWTC7S32F	IC
IC2	YWCXA1439M	IC
IC3	MN53003LBJ	IC
IC5	NJM2904MT3	IC
IC6	YWMB621488U	IC
IC7	YWUPD16501GS	IC
IC8,9	MN13821P	IC
IC10	NJM3414MT3	IC
IC14	NJM2904MT3	IC
IC20,21	YWTC7S32F	IC
Q1	2SC4619	Transistor or
	2SC4627	Transistor
Q2	2SC4619	Transistor
	2SC4627	Transistor
Q3	2SC4619	Transistor or
	2SC4627	Transistor
Q4	2SC4619	Transistor or
	2SC4627	Transistor
Q6	2SK662-PQR	FET or
	2SK853	Transistor
Q7	2SB766-RS	Transistor
Q10	2SA1576	Transistor or
	2SB1218-QRS	Transistor
Q12	2SC4617	Transistor or
	2SD2216	Transistor
Q13	2SC4617	Transistor or
	2SD2216	Transistor
Q17	2SA1774	Transistor or
	2SB1462	Transistor
Q18	2SA1774	Transistor or
	2SB1462	Transistor
Q19	2SC4617	Transistor or
	2SD2216	Transistor
Q20	2SC4617	Transistor or
	2SD2216	Transistor
Q21	2SC4617	Transistor or
	2SD2216	Transistor
Q22	2SC4617	Transistor or
	2SD2216	Transistor
Q23	2SA1774	Transistor or
	2SB1462	Transistor
Q24	2SC4617	Transistor or
	2SD2216	Transistor
Q27	2SD874-RS	Transistor
Q30	2SB766-RS	Transistor
Q33	2SA1774	Transistor or
	2SB1462	Transistor
Q34	2SA1774	Transistor or
	2SB1462	Transistor
Q35	2SA1774	Transistor or

REF.NO.	PART NO.	DESCRIPTION	
	2SB1462	Transistor	
Q36	2SA1774	Transistor or	
	2SB1462	Transistor	
Q38	2SC4617	Transistor or	
	2SD2216	Transistor	
Q39	2SA1774	Transistor or	
	2SB1462	Transistor	
D1	YWDA121	Diode or	
	MA132K	Diode	
D2	YWDA221	Diode or	
	MA133	Diode	
D4	YWDA221	Diode or	
	MA133	Diode	
D5	YWDTZ11	Diode or	
	MA8110	Diode	
D6	YWDTZ20	Diode or	
	MA8200	Diode	
D7,8	MA372	Diode	
D11	YWDA121	Diode or	
	MA132K	Diode	
D12	YWDA121	Diode or	
	MA132K	Diode	
R1	ERJ3GEYJ912	Carbon	9.1K ohms 1/16W
R2,3	ERJ3GEYJ911	Carbon	910 ohms 1/16W
R4	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R5,7	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R9	ERJ3GEYJ391	Carbon	390 ohms 1/16W
R10	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R11	ERJ3GEYJ221	Carbon	220 ohms 1/16W
R12	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R13	ERJ3GEYJ392	Carbon	3.9K ohms 1/16W
R14	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R15	ERJ3GEYJ181	Carbon	180 ohms 1/16W
R16	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R18	ERJ3GEYJ331	Carbon	330 ohms 1/16W
R21	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R22	ERJ3GEYJ221	Carbon	220 ohms 1/16W
R24	ERJ3GEYJ302	Carbon	3K ohms 1/16W
R26	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R27	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R29	ERJ3GEYJ752	Carbon	7.5K ohms 1/16W
R32	ERJ3GEY0R00	Carbon	0 ohms1/16W
R33,34	ERJ3GEYJ100	Carbon	10 ohms 1/16W
R36	ERJ3GEY0R00	Carbon	0 1/16W
R37	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R40,43	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R44,45	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R48	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R49	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R50	ERJ3GEYJ221	Carbon	220 ohms 1/16W
R51,52	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R53	ERJ3GEYJ681	Carbon	680 ohms 1/16W
R54,58	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R61,63	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R66,68	ERJ3GEY0R00	Carbon	0 ohms 1/16W

REF.NO.	PART NO.	DESCRIPTION	
R70	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R72	YWR0816P302D	Metal	3K ohms 1/16W
R76	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R77	YWR0816P242D	Metal	2.4K ohms 1/16W
R78	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R79	YWR0816P332D	Metal	3.3K ohms 1/16W
R80	YWR0816P222D	Metal	2.2K ohms 1/16W
R82	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R84	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R85	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W
R86	ERJ3GEYJ152	Carbon	1.5K ohms 1/16W
R87,88	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R89	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R90-92	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R94	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R95	ERJ3GEYJ202	Carbon	2K ohms 1/16W
R96	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R99	ERJ3GEYJ243	Carbon	24K ohms 1/16W
R101	ERJ3GEYJ105	Carbon	1M ohms 1/16W
R104	ERJ3GEYJ104	Carbon	100K ohms 1/16W
R109,112	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R113	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R114	ERJ3GEYJ620	Carbon	62 ohms 1/16W
R115	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R116	ERJ3GEYJ332	Carbon	3.3K ohms 1/16W
R117	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R118	YWR0816P302D	Metal	3K ohms 1/16W
R119	YWR0816P153D	Metal	15K ohms 1/16W
R120	ERJ3GEYJ152	Carbon	1.5K ohms 1/16W
R121	ERJ3GEYJ100	Carbon	10 ohms 1/16W
R122	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R123	ERJ3GEYJ392	Carbon	3.9K ohms 1/16W
R124	YWR0816P472D	Metal	4.7K ohms 1/16W
R125	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R126	YWR0816P243D	Metal	24K ohms 1/16W
R127	YWR0816P103D	Metal	10K ohms 1/16W
R130	YWR0816P242D	Metal	2.4K ohms 1/16W
R131	YWR0816P153D	Metal	15K ohms 1/16W
R134	ERJ3GEYJ104	Carbon	100K ohms 1/16W
R136	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R137	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W
R139	ERJ3GEYJ153	Carbon	15K ohms 1/16W
R140	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R141	ERJ3GEYJ154	Carbon	150K ohms 1/16W
R142	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R143	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R144	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R145,146	YWR0816P103D	Metal	10K ohms 1/16W
R147	ERJ3GEYJ560	Carbon	56 ohms 1/16W
R148	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R153,154	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R155,156	ERJ3GEYJ473	Carbon	47K ohms 1/16W
R159,160	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R163	ERJ3GEYJ470	Carbon	47 ohms 1/16W
R164	YWR0816P242D	Metal	2.4K ohms 1/16W

REF.NO.	PART NO.	DESCRIPTION	
R165	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R166	ERJ3GEYJ470	Carbon	47 ohms 1/16W
R167	ERJ3GEYJ512	Carbon	5.1K ohms 1/16W
R213	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R214	ERJ3GEYJ682	Carbon	6.8K ohms 1/16W
R215	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W
R216	ERJ3GEYJ682	Carbon	6.8K ohms 1/16W
R217	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R219-221	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R228	ERJ3GEYJ331	Carbon	330 ohms 1/16W
R229	ERJ3GEYJ821	Carbon	820 ohms 1/16W
R231	YWR0816P302D	Metal	3K ohms 1/16W
R232	YF2116101JT	Carbon	100 ohms 1/10W
R233	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R237,238	ERJ6GEY0R00	Carbon	1 ohms 1/10W
C5,6	YW5CH100J5VB	Ceramic	10 pF
C7	YW5X103K2VB	Ceramic	0.01 µF
C8	YW5SL102K5VB	Ceramic	1000 pF
C9	YW5CH101J5VB	Ceramic	100 pF
C10	YW5CH331J5VB	Ceramic	330 pF
C12	YW5F104Z2VB	Ceramic	0.1 µF
C13	YW5CH331J5VB	Ceramic	330 pF
C14,15	YW5X103K2VB	Ceramic	0.01 µF
C16	YW5CH101J5VB	Ceramic	100 pF
C19	YW5F104Z2VB	Ceramic	0.1 µF
C26	YF400224FZT	Ceramic	0.22 µF
C28	YW5X103K2VB	Ceramic	0.01 µF
C33,35	YF400104FZT	Ceramic	0.1 µF
C36	YF400104FZT	Ceramic	0.1 µF
C37	ECEV1CG470GP	Electrolytic	47 µF 16V
C38	ECEV1CV100	Electrolytic	10 µF 16V
C39	ECST1VY104	Tantalum	0.1 µF 35V
C40	ECST1DC106	Tantalum	10 µF 20V
C41	TAJC106M016	Tantalum	10 µF 16V
C43	ECEV1CV100	Electrolytic	10 µF 16V
C44,45	TAJC106M016	Tantalum	10 µF 16V
C46	ECEV1HV2R2SR	Electrolytic	2.2 µF 50V
C54	ECEV1CV470SP	Electrolytic	47 µF 16V
C56	TAJC106M016	Tantalum	10 µF 16V
C57	ECST1VD685	Tantalum	6.8 µF
C60	ECEV1CV100	Electrolytic	10 µF 16V
C62	ECEV1HV100SP	Electrolytic	10 µF 50V
C63	ECEV1EV220	Electrolytic	22 µF 25V
C68,70	ECEV1CV470SP	Electrolytic	47 µF 16V
C72	ECST0GY106	Tantalum	10 µF 4V
C74	TAJA105M016	Tantalum	1 µF 16V
C77	YW5F473Z2VB	Ceramic	0.047 µF
C78	YW5X222K5VB	Ceramic	2200 pF
C79,81	YW5F104Z2VB	Ceramic	0.1 µF
C82,83	ECEV1CV100	Electrolytic	10 µF 16V
C95	ECEV1CV470SP	Electrolytic	47 µF 16V
C103	ECST1AD476ZR	Tantalum	47 µF 10V
C105	YW5CH151J5VB	Ceramic	150 pF
C107	YW5CH120J5VB	Ceramic	12 pF
C114	ECEV1CV470SP	Electrolytic	47 µF 16V

REF.NO.	PART NO.	DESCRIPTION	
C115	ECEV1CV100	Electrolytic	10 µF 16V
C117	ECEV1HV4R7SP	Electrolytic	4.7 µF 50V
C118-120	YW5X102K5VB	Ceramic	1000 pF
C123,124	YW5X102K5VB	Ceramic	1000 pF
C138	ECEV1CV470SP	Electrolytic	47 µF 16V
C144	ECEV1EV330	Electrolytic	33 µF 25V
L1,5	ELJFC8R2MF	Coil	8.2 µH
L6,10	ELJFC8R2MF	Coil	8.2 µH
L12	EIC4EJ004E	Coil	
L15,18	ELJFC8R2MF	Coil	8.2 µH
L21	YWCD75391KC	Coil	
L22	YWNL32221J	Coil	
CF1	ELB4B532	Filter	
CN1	YW523961490	14-pin Connector	
CN2	YW522051890	18-pin Connector	
CN3	YW522051490	14-pin Connector	
CN4	YW31756356	6-pin Connector	
CN7	YW522051890	18-pin Connector	
CN8,9	YW71756436	16-pin Connector	
TP1	YWRCT2125TPV	Test Point	

DIGITAL BOARD

REF.NO.	PART NO.	DESCRIPTION
PCB12 (RTL)	YWVKCCS50E1A	Printed Circuit Board Assy
IC1	AN2015FAP	IC
IC2,3	NJM4558M	IC
IC6	YWCXD1175AM	IC
IC7	YWM6M80021FP	IC
IC8	MN6730FHP	IC
IC9	MN6731FHP	IC
IC10	MN188166CUQ2	IC
IC12	MN65701FHP	IC
IC13	MN53020LB02	IC
IC14	M50554254FP	IC
IC15	YWTC7S32F	IC
Q8	2SC4617	Transistor or
	2SD2216	Transistor
Q9	2SA1774	Transistor or
	2SB1462	Transistor
Q10	2SA1774	Transistor or
	2SB1462	Transistor
Q11	2SC4617	Transistor or
	2SD2216	Transistor
Q14	2SC4617	Transistor or
	2SD2216	Transistor
Q15	2SC4617	Transistor
	2SD2216	Transistor
Q16	2SC4617	Transistor
	2SD2216	Transistor

REF.NO.	PART NO.	DESCRIPTION	
Q17	2SC4619	Transistor	
	2SC4627	Transistor	
Q18-22	FA3L4ZT1B	Transistor	
Q26	2SA1774	Transistor	
	2SB1462	Transistor	
Q27	2SC4617	Transistor	
	2SD2216	Transistor	
D2	YWDA221	Diode	
	MA133	Diode	
D3	YWDA221	Diode	
	MA133	Diode	
D4	YWDA221	Diode	
	MA133	Diode	
TH215	L311F431J502	Thermistor	
R9	ERJ3GEYJ392	Carbon	3.9K ohms 1/16W
R19	ERJ3GEYJ473	Carbon	47K ohms 1/16W
	ERJ6GEY0R00	Carbon	1 ohms 1/10W
R20	ERJ3GEYJ103	Carbon	10K ohms 1/16W
	ERJ6GEY0R00	Carbon	1 ohms 1/10W
R21	ERJ3GEYJ332	Carbon	3.3K ohms 1/16W
R23	ERJ3GEYJ112	Carbon	1.1K ohms 1/16W
R25	ERJ3GEYJ332	Carbon	3.3K ohms 1/16W
R28	ERJ3GEYJ331	Carbon	330 ohms 1/16W
R30	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R31	ERJ3GEYJ272	Carbon	2.7K ohms 1/16W
R33	ERJ3GEYJ152	Carbon	1.5K ohms 1/16W
R34,36	ERJ3GEYJ682	Carbon	6.8K ohms 1/16W
R37	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W
R38-41	ERJ3GEYJ682	Carbon	6.8K ohms 1/16W
R42-44	ERJ3GEYJ122	Carbon	1.2K ohms 1/16W
R45,46	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R47	ERJ3GEYJ122	Carbon	1.2K ohms 1/16W
R48	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R50	ERJ3GEYJ122	Carbon	1.2K ohms 1/16W
R53	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R56	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R58,59	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R68,69	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R72,73	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R76	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R77	ERJ3GEYJ100	Carbon	10 ohms 1/16W
R78,79	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R82,85	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R94	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R95	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R96	YWR0816P221D	Metal	220 ohms 1/16W
R97	YWR0816P102D	Metal	1K ohms 1/16W
R98	YWR0816Q560D	Metal	56 ohms 1/16W
R99	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R100,101	YWR0816P221D	Metal	220 ohms 1/16W
R104	YWR0816P472D	Metal	4.7K ohms 1/16W
R105	YWR0816P562D	Metal	5.6K ohms 1/16W
R106,113	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R114	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R115	ERJ3GEYJ102	Carbon	1K ohms 1/16W

REF.NO.	PART NO.	DESCRIPTION	
R116	ERJ3GEYJ271	Carbon	270 ohms 1/16W
R117	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R118-120	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R122	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R123	ERJ3GEYJ105	Carbon	1M ohms 1/16W
R133,136	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R137-148	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R150-157	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R158	ERJ3GEYJ122	Carbon	1.2K ohms 1/16W
R159	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R160	ERJ3GEYJ122	Carbon	1.2K ohms 1/16W
R161	ERJ3GEYJ682	Carbon	6.8K ohms 1/16W
R162	ERJ3GEYJ122	Carbon	1.2K ohms 1/16W
R163,164	ERJ3GEYJ682	Carbon	6.8K ohms 1/16W
R166,167	ERJ3GEYJ471	Carbon	470 ohms 1/16W
R168-180	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R184,185	ERJ3GEYJ473	Carbon	47K ohms 1/16W
R186	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R187	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R188	ERJ3GEYJ302	Carbon	3K ohms 1/16W
R189	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R190	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R191	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R192	ERJ3GEYJ562	Carbon	5.6K ohms 1/16W
R193	ERJ3GEYJ821	Carbon	820 ohms 1/16W
R194	ERJ3GEYJ562	Carbon	5.6K ohms 1/16W
R195	ERJ3GEYJ100	Carbon	10 ohms 1/16W
R196	ERJ3GEYJ2R2	Carbon	2.2 ohms 1/16W
R197	ERJ3GEYJ221	Carbon	220 ohms 1/16W
R198	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R199	ERJ3GEYJ181	Carbon	180 ohms 1/16W
R200	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R201,206	ERJ6GEY0R00	Carbon	1 ohms 1/10W
R207-213	ERJ6GEY0R00	Carbon	1 ohms 1/10W
R214	ERJ3GEYJ104	Carbon	100K ohms 1/16W
Z1-6	EXBV8V470J	Block Resistor	
C3	YW5F473Z2VB	Ceramic	0.047 µF
C6-8	YW5CH120J5VB	Ceramic	12 pF
C9	YW5CH151J5VB	Ceramic	150 pF
C10	YW5CH101J5VB	Ceramic	100 pF
C12	YW5CH120J5VB	Ceramic	12 pF
C15	YW5CH330J5VB	Ceramic	33 pF
C16	YW5CH151J5VB	Ceramic	150 pF
C17	YW5X102K5VB	Ceramic	1000 pF
C18	YW5CH120J5VB	Ceramic	12 pF
C20	YW5CH150J5VB	Ceramic	15 pF
C21	YW5CH101J5VB	Ceramic	100 pF
C22	YW5CH151J5VB	Ceramic	150 pF
C23	YW5F104Z2VB	Ceramic	0.1 µF
C27,29	YW5CH101J5VB	Ceramic	100 pF
C32,35	YW5F104Z2VB	Ceramic	0.1 µF
C36	YW400474FZ	Ceramic	0.47 µF
C37	YW5F104Z2VB	Ceramic	0.1 µF
C38,40	YW5CH120J5VB	Ceramic	12 pF
C45	YW5F104Z2VB	Ceramic	0.1 µF

REF.NO.	PART NO.	DESCRIPTION
C46,47	YF400104FZT	Ceramic 0.1 μF
C48	ECST0JY335	Electrolytic 3.3 μF 6.3V
C49,50	YF400103XKT	Ceramic 0.01 μF
C56	ECST0JY475	Electrolytic 4.7 μF 6.3V
C57	ECST0JY685	Tantalum 6,8 μF 6.3V
C58	ECST1AB106	Tantalum 10 μF 10V
C59	TAJM226M004	Tantalum 22 μF 4V
C60	ECST0JY475	Tantalum 4.7 μF 6.3V
C61	ECST0GY475Z	Tantalum 4.7 μF 4V
C62	ECST1DC685ZR	Tantalum 6.8 μF 20V
C63	ECST1CB475ZR	Tantalum 4.7 μF 16V
C64	ECST1AD476ZR	Tantalum 47 μF 10V
C65	ECST1VY104	Tantalum 0.1 μF 35V
C67	TAJC106M010	Tantalum 10 μF 10V
C69	ECST1AB106	Tantalum 10 μF 10V
C70	ECST0GY106	Tantalum 10 μF 4V
C71	ECST1AB106	Tantalum 10 μF 10V
C72	TAJC106M016	Tantalum 10 μF 16V
C73,75	TAJC106M010	Tantalum 10 μF 10V
C77,78	TAJC106M010	Tantalum 10 μF 10V
C80	TAJC106M010	Tantalum 10 μF 10V
C82	ECEV1CV100	Electrolytic 10 μF 16V
C83	TAJC106M010	Tantalum 10 μF 10V
C84-86	TAJC226M010	Tantalum 22 μF 10V
C87	ECST0JB106ZR	Tantalum 10 μF 6.3V
C88	TAJC106M010	Tantalum 10 μF 10V
C89	TAJC226M010	Tantalum 22 μF 10V
C90,91	ECST1AB106	Tantalum 10 μF 10V
C92	ECST1AD476ZR	Tantalum 47 μF 10V
C93,95	YW5F104Z2VB	Ceramic 0.1 μF
C96	ECST1AY475	Tantalum 4.7 μF 10V
C157,159	YW5CH100J5VB	Ceramic 10 pF
L1,2	ELJFC8R2MF	Coil 8.2 μH
L4,7	ELJFC8R2MF	Coil 8.2 μH
L8,10	ELJFC8R2MF	Coil 8.2 μH
L11,13	ELJFC8R2MF	Coil 8.2 μH
L14,25	ELJFC8R2MF	Coil 8.2 μH
L28,30	ELJFC8R2MF	Coil 8.2 μH
X1	EF0V8004E0A	Crystal Oscillator
CF4	ELB4A512	Filter
CF5	EIK4EW001T	Filter
CF6	EIK4EW002T	Filter
CN1,2	YW71756436	16-pinConnector
CN3,4	YW523961890	18-pin Connector
CN5,6	YW31756316	6-pin Connector

REF.NO.	PART NO.	DESCRIPTION
POWER BOARD		
PCB13 (RTL)	YWVKYCS50P2A	Printed Circuit Board Assy
IC1	M5237L	IC
IC2	YWTC4S11F	IC
Q1	2SK612	FET
D2,3	YWF1H4TP	Diode
R1	ERJ3GEYJ221	Carbon 220 ohms 1/16W
R2	ERJ3GEYJ471	Carbon 470 ohms 1/16W
R3	ERJ3GEYJ223	Carbon 22K ohms 1/16W
R4	ERJ3GEY0R00	Carbon 0 ohms 1/16W
R6	ERJ3GEYJ332	Carbon 3.3K ohms 1/16W
R20	ERJ3GEYJ104	Carbon 100K ohms 1/16W
R50,51	ERJ3GEYJ333	Carbon 33K ohms 1/16W
VR1	EVM7JGA30B53	Variable Resistor 5K ohms
C1	YW5X102K5VB	Ceramic 1000 pF
C2	ECQM1H104JZ	Plastic 0.1 μF 50V
C3	YW5F104Z2VB	Ceramic 0.1 μF
C5	YW400A123XKS	Ceramic 0.1 μF
C6,7	ECEA1CGE101	Electrolytic 100 μF 16V
C9	ECEA1AGE221	Electrolytic 220 μF 10V
C11	ECEA1EGE101	Electrolytic 100 μF 25V
C12	ECEA1AFS331	Electrolytic 100 μF 10V
C50	YW5F104Z2VB	Ceramic 0.1 μF
C51,52	ECEA0JGE331	Electrolytic 330 μF 6V
C53	ECEA0JGE471	Electrolytic 470 μF 6V
C54	ECKF1H222MD	Ceramic 2200 pF 50V
L1	YW664D101K	Coil
T1	ETE11K10AY	Power Transformer
SW50	YWSSS912L2NH	Slide Switch
F1 ⚠	YWSSFR1A	Current Fuse 1A 125V
CN2,3	YW11746356	16-pin Connector
CN4	YWS3BPHKS	3-pin connector Connector
CN5	YW530150610	6-pin Connector
TP1	YWRCT2125TPV	Test- Pin

SYNC/ENCODER BOARD

REF.NO.	PART NO.	DESCRIPTION	
PCB14 (RTL)	YWVKDCS50E1A	Printed Circuit Board Assy	
IC4	AN2254FAP	LSI	
IC5	YWM62352GP	IC	
IC7	MN73093LBX	IC	
IC8	NJM2903M	IC	
IC9	YWTC7S32F	IC	
IC10	YWTC4S69F	IC	
IC11,12	YWTC7S04F	IC	
Q1	2SK853	Transistor	
Q2,3	2SK662-PQR	FET	
Q7	2SK853	Transistor	
Q10	2SA1774	Transistor	
	2SB1462	Transistor	
Q11	2SA1774	Transistor	
	2SB1462	Transistor	
Q29	2SC4617	Transistor	
	2SD2216	Transistor	
Q45	UMX1	Transistor	
	XP4501	Transistor	
Q46	2SC4617	Transistor	
	2SD2216	Transistor	
Q47	2SA1774	Transistor	
	2SB1462	Transistor	
Q48	2SA1774	Transistor	
	2SB1462	Transistor	
Q49	2SC4617	Transistor	
	2SD2216	Transistor	
Q50	UMZ1	Transistor	
	XP4601	Transistor	
D1	YWDA120	Diode	
	MA132A	Diode	
D2-7	MA372	Diode	
D8,9	MA729	Diode	
D10	YWDA120	Diode	
	MA132A	Diode	
D11	YWDA120	Diode	
	MA132A	Diode	
R1	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W
R3	ERJ3GEYJ183	Carbon	18K ohms 1/16W
R4	ERJ3GEYJ822	Carbon	8.2K ohms 1/16W
R6	ERJ3GEYJ221	Carbon	220 ohms 1/16W
R7	ERJ3GEYJ332	Carbon	3.3K ohms 1/16W
R8	ERJ3GEYJ224	Carbon	220K ohms 1/16W
R9	ERJ3GEYJ112	Carbon	1.1K ohms 1/16W
R10	ERJ3GEYJ105	Carbon	1M ohms 1/16W
R11,12	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R13	ERJ3GEYJ333	Carbon	33K ohms 1/16W
R15,16	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R17	ERJ3GEYJ333	Carbon	33K ohms 1/16W
R18	ERJ3GEYJ184	Carbon	180K ohms 1/16W
R19	ERJ3GEYJ223	Carbon	22K ohms 1/16W
R21-24	ERJ3GEYJ333	Carbon	33K ohms 1/16W
R27	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R28,29	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R30	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R32	ERJ3GEYJ332	Carbon	3.3K ohms 1/16W
R33	ERJ3GEYJ511	Carbon	510 ohms 1/16W
R34	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R35	ERJ3GEYJ332	Carbon	3.3K ohms 1/16W
R37	ERJ3GEYJ561	Carbon	560 ohms 1/16W
R39	ERJ3GEYJ332	Carbon	3.3K ohms 1/16W
R41,43	ERJ3GEYJ221	Carbon	220 ohms 1/16W
R44	ERJ3GEYJ822	Carbon	8.2K ohms 1/16W
R45,46	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R47	ERJ3GEYJ221	Carbon	220 ohms 1/16W
R48,50	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R51,52	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R56	ERJ3GEYJ334	Carbon	330K ohms 1/16W
R58	ERJ3GEYJ332	Carbon	3.3K ohms 1/16W
R59	ERJ3GEYJ104	Carbon	100K ohms 1/16W
R62	ERJ3GEYJ105	Carbon	1M ohms 1/16W
R63	ERJ3GEYJ823	Carbon	82K ohms 1/16W
R66,67	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R70	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R71	ERJ3GEYJ105	Carbon	1M ohms 1/16W
R73	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R74,75	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R77	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R79	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R80	YWR0816P331D	Metal	330 ohms 1/16W
R82	ERJ3GEYJ391	Carbon	390 ohms 1/16W
R83	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R84	YWR0816P681D	Metal	680 ohms 1/16W
R85	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R86	ERJ3GEYJ334	Carbon	330K ohms 1/16W
R88	ERJ3GEYJ272	Carbon	2.7K ohms 1/16W
R89	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R90	ERJ3GEYJ113	Carbon	11K ohms 1/16W
R91	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R92	ERJ3GEYJ912	Carbon	9.1K ohms 1/16W
R95	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R97	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W
R102	ERJ3GEYJ153	Carbon	15K ohms 1/16W
R103	ERJ3GEYJ391	Carbon	390 ohms 1/16W
R107	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R110	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R112	ERJ3GEYJ562	Carbon	5.6K ohms 1/16W
R113	ERJ3GEYJ153	Carbon	15K ohms 1/16W
R120,123	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R124,129	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R132	YF2116431JT	Carbon	430 ohms 1/10W
R144	ERJ3GEYJ223	Carbon	22K ohms 1/16W
R148	ERJ3GEYJ752	Carbon	7.5K ohms 1/16W
R163	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R166	ERJ3GEYJ561	Carbon	560 ohms 1/16W
R167	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W

REF.NO.	PART NO.	DESCRIPTION	
R168	ERJ3GEYJ202	Carbon	2K ohms 1/16W
R170	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R176,179	YWR0816P471D	Metal	470 ohms 1/16W
R182	YWR0816P302D	Metal	3K ohms 1/16W
R183	YWR0816P751D	Metal	750 ohms 1/16W
R187	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R188	ERJ3GEYJ392	Carbon	3.9K ohms 1/16W
R189	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R190	ERJ3GEYJ393	Carbon	39K ohms 1/16W
R191	ERJ3GEYJ392	Carbon	3.9K ohms 1/16W
R192	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R193	ERJ3GEYJ392	Carbon	3.9K ohms 1/16W
R194	ERJ3GEYJ393	Carbon	39K ohms 1/16W
R195	ERJ3GEYJ392	Carbon	3.9K ohms 1/16W
R196	ERJ3GEYJ113	Carbon	11K ohms 1/16W
R198	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R199,200	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R203	ERJ3GEYJ152	Carbon	1.5K ohms 1/16W
R204	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W
R205	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R206,210	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R212	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R213	ERJ3GEYJ104	Carbon	100K ohms 1/16W
R214,215	ERJ3GEYJ332	Carbon	3.3K ohms 1/16W
R216	ERJ3GEYJ151	Carbon	150 ohms 1/16W
R217	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R218	ERJ3GEYJ221	Carbon	220 ohms 1/16W
R219	ERJ3GEYJ751	Carbon	750 ohms 1/16W
R220,221	ERJ6GEY0R00	Carbon	1 ohms 1/10W
C1	YF400104FZT	Ceramic	0.1 µF
C2	YW5CH120J5VB	Ceramic	12 pF
C3	YW5X122K5VB	Ceramic	1200 pF
C4,5	YW5CH331J5VB	Ceramic	330 pF
C6	YW5F104Z2VB	Ceramic	0.1 µF
C7	YW5CH121J5VB	Ceramic	120 pF
C8	YW5X103K2VB	Ceramic	0.01 µF
C9	YW5CH910J5VB	Ceramic	91 pF
C10	YW5CH750J5VB	Ceramic	75 pF
C11,12	YF400104FZT	Ceramic	0.1 µF
C17	YW5CH331J5VB	Ceramic	330 pF
C18	YW5F104Z2VB	Ceramic	0.1 µF
C19	YF400104FZT	Ceramic	0.1 µF
C21	YW5CH271J5VB	Ceramic	270 pF
C22	YW5CH331J5VB	Ceramic	330 pF
C23	YW5CH271J5VB	Ceramic	270 pF
C24,25	YW5X103K2VB	Ceramic	0.01 µF
C26	YW5CH270J5VB	Ceramic	27 pF
C28	YW5X103K2VB	Ceramic	0.01 µF
C32,33	YF426104XKS	Ceramic	0.1 µF
C34,35	YW5F104Z2VB	Ceramic	0.1 µF
C43	YW5F104Z2VB	Ceramic	0.1 µF
C45	YW5X103K2VB	Ceramic	0.01 µF
C46	YW400393XKT	Ceramic	0.039 µF
C47-52	YF400104FZT	Ceramic	0.1 µF
C53	ECST0JY335	Tantalum	3.3 µF 6.3V

REF.NO.	PART NO.	DESCRIPTION	
C54,56	YF400104FZT	Ceramic	0.1 µF
C62	YW400393XKT	Ceramic	0.039 µF
C64,66	TAJC106M010	Tantalum	10 µF 10V
C67	ECEV1EV220	Electrolytic	22 µF 25V
C69	ECST0JB106ZR	Tantalum	10 µF 6.3V
C71	TAJC156M010	Tantalum	15 µF 10V
C73	TAJC106M010	Tantalum	10 µF 10V
C74	TAJA105M016	Tantalum	1 µF 16V
C75	ECST1AY225ZR	Tantalum	2.2 µF 10V
C76	TAJC156M010	Tantalum	15 µF 10V
C77	ECST1VY224Z	Tantalum	0.22 µF 35V
C78	TAJC156M010	Tantalum	15 µF 10V
C79	TAJC336M004	Tantalum	33 µF 4V
C81,82	TAJC106M016	Tantalum	10 µF 16V
C83	ECEV1CV100	Electrolytic	10 µF 16V
C86	YW5CH101J5VB	Ceramic	100 pF
C87	YW5F104Z2VB	Ceramic	0.1 µF
C88	ECEV1CV100	Electrolytic	10 µF 16V
C89	TAJA105M016	Tantalum	1 µF 16V
C90	YW5F104Z2VB	Ceramic	0.1 µF
C92	TAJA105M016	Electrolytic	1 µF 16V
C93	ECEV1CV100	Electrolytic	10 µF 16V
C94	ECST1ED106ZR	Tantalum	10 µF 25V
C95,97	ECEV1CV470SP	Electrolytic	47 µF 16V
C98	YF400224FZT	Ceramic	0.22 µF
C99	YW5F104Z2VB	Ceramic	0.1 µF
C100	YW5CH221J5VB	Ceramic	220 pF
L1	ELJFC8R2MF	Coil	8.2 µH
L5	EIC4EJ003E	Coil	
L7,8	ELJFC8R2MF	Coil	8.2 µH
L10,11	ELJFC8R2MF	Coil	8.2 µH
X1	YWDX17R734	Crystal Oscillator	
X2	YWDX14R187	Crystal Oscillator	
CF3	ELB4D537	Filter	
CF6	YWNL4532S4R4	Filter	
CN1,2	YW41756386	16-pin Connector	
CN3	YW523961490	14-pin Connector	
TP1-3	YWRCT2125TPV	Test- Pin	
TP7	YWRCT2125TPV	Test- Pin	

EVR RELAY BOARD

REF.NO.	PART NO.	DESCRIPTION
PCB15 (RTL)	YWVKYCS50J1A	Printed Circuit Board Assy
L1-4	YWNL32R68K	Coil 0.68 µH
CN1	YW530470410	4-pin Connector
CN2	YW31746436	6-pin Connector

ACCESSORY PARTS/PACKAGING PARTS

REF.NO.	PART NO.	DESCRIPTION
E100	YWVCS500L26A	Connector Cable Assy
M90	YWV5EA1112A2	Decoration Cover
M91	YWV4JA0404A4	Spring
M92	YWV5YB0053AN	Band
M95	YWV8QA3406AN	Operating Instructions
M98	XZB26X40C05	Polyethylene Bag for Printed
M99	XZB35X50C05	Polyethylene Bag for WV-CS500
M100	YWA8EA0040A4	Polyethylene Bag for Power Cord
M101	YWV9CA2412AN	Packaging Assy

POWER SUPPLY UNIT WV-PS51U

MISCELLANEOUS

REF.NO.	PART NO.	DESCRIPTION
SW1 ⚠	EST15797V	Power Switch
T1 ⚠	YWPHB88V066	Power Transformer
F1 ⚠	YFBET1A250V	Current Fuse 1A 250V
F2 ⚠	XBA2C50ET0A	Current Fuse 5A 250V
E101	YW840522	Fuse Insulator Cover
M1	YWV5KA1275A2	Bottom Case
M2	YWV6EA0178A2	Upper Cover
M3	YWV6EA0199A4	Lid
M4	YWV2KA0817A2	Power Chassis
M5	YWV2JA0098A4	Bracing Strut
M6	YWV2PA0552A3	Insulator Cover for Transformer
M7	YWV7MA0015A4	FCC Label
M8	YWA6DA0034A4	Fastener
M9	YWV7QA3438A4	Main Label
M10	YWV7QA2372A4	System Label
M11	YWV7SA2082A4	Operation Caution Label
M14	YWV1EA0185A4	Special Screw
M15	YWV1FA0044A4	Nut Plate
M16	YWV1KA0162A4	Washer
M17	YWV1KA0163A4	Washer
M18	YWV7PA0104A4	Panasonic Badge
M20	YWV5QA0055A4	Hinge
M26	YWV6EA0180A4	Lid
M27	YFV7MB0106A4	Safety Label
M28	YWV7SA1924A4	Label
M29	YWV7SA0081A4	Label

POWER SWITCH BOARD

REF.NO.	PART NO.	DESCRIPTION	
PCB1 (RTL)	YWVKZPS51E1A	Printed Circuit Board Assy	
D1 ⚠	YWRBV602	Diode	
D2	LN28RP	LED	
VS1-3 ⚠	ERZC14DK271	ZNR	
VS4 ⚠	DSA242MA06UL	Varistor	
VS5 ⚠	ERZC07DK680	ZNR	
VS6	ERZC07DK560	ZNR	
R1	ERDS1VJ332	Carbon	3.3K ohms
C1-4	ECQM1H104JZ	Plastic	0.1 µF 50V
C5	ECQM1H334KZ	Plastic	0.33 µF
C6-8	EC0S1HA103E	Electrolytic	0.01 µF 50V
C12	ECQM1H334KZ	Plastic	0.33 µF
CN1	YWULP630B4P	4-pin Terminal	
CN2	YWB2P3VH	2-pin Connector	
CN3	YWB2PVH	2-pin Connector	
CN4	YWKW3118B3P	3-pin Terminal	
CN5	YWB2P3VH	2-pin Connector	
CN6	YWB2P3VH	2-pin Connector	
E1,2	YWF60A	Fuse Holder	
E5	YW851640	Internal Cap	
M22	YWV2PA0551A4	Insulator	
M23	YWV7DA0346A4	Heat Sink	
M24	YWV2SA2443A4	Mounting Angle	
M25	YWV2SA2444A4	Mounting Angle	

ACCESSORY PARTS/PACKAGING PARTS

REF.NO.	PART NO.	DESCRIPTION
M35	YWT10X16C03	Polyethylene Bag
M36	YWRF100	Band
M37	SGA-7	Cord Clamp
M40	XZB35X50C05	Polyethylene Bag
M42	YWV9CA2411AN	Packaging Assy

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